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THE UNFINISHED PROBLEMS
Pertaining to Country and Profession Are Marked for Thoughtful Attention
There are millions of acres to clear and reforest, vast deserts to irrigate and swamps to drain, no end of soil erosion to stop and long stretches of streams to purify; there are hundreds of miles of four-lane highways to build and countless grade crossings to abolish, air fields to construct, and thousands of miles of pole-strung wires to put under ground, to name but a few of the unfinished problems;
but all these combined are trivial compared with productive farms and healthy livestock, the sole source of life and stable economics which, however approached, resolve to healthy domestic animals and the wholesomeness of their products—the task of veterinary medicine scientifically practiced.
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Journal
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Rabies and Its Control

This report was prepared by a special subcommittee of the Committee on Animal Health, National Research Council, composed of Harold N. Johnson, M.D. (Chairman), Rockefeller Foundation; A. L. Brueckner, V.M.D., Maryland State Livestock Sanitary Board; Karl Habel, M.D., National Institute of Health; R. A. Kelser, D.V.M., University of Pennsylvania; H. W. Schoening, V.M.D., Bureau of Animal Industry, USDA; and T. F. Sellers, M.D., Georgia State Department of Public Health.

The wide prevalence of rabies in the United States calls for concerted action for the control of this dreadful disease. The scientific facts necessary to that end are known.

COMMITTEE ON ANIMAL HEALTH

George H. Hart, Chairman

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RABIES is an acute, specific infection of the central nervous system caused by a filterable virus. In a state of nature, the disease is propagated in dogs and related animals, such as the wolf, fox, and coyote. Man and all warm-blooded animals are susceptible.

The virus is often present in the saliva of rabid animals, and the disease therefore is most commonly transmitted by a bite. The virus cannot penetrate the normal skin but may enter the body if infected saliva gets into a fresh wound.

INCIDENCE OF RABIES

Rabies is a disease that has been known since ancient times. It is world wide in distribution and has been reported in the Arctic as well as in tropical regions. Only a few islands, such as Australia and Hawaii, have remained free of the disease. Though rabies has been present in Europe, Asia, and Africa for centuries, there is no evidence to indicate that the disease existed in North America prior to colonization. Historical archives of Virginia contain references to canine rabies as early as 1753 and those of North Carolina as early as 1762. The disease became prevalent in the vicinity of Boston in 1768. By 1785, it had been disseminated throughout New England. By 1860, it had invaded most of the states east of the Mississippi and had been reported as far west as New Mexico. In 1899, the disease appeared in California and since then has remained enzoötic over most of the United States.

Though rabies has been spread and maintained almost entirely in domestic dogs, there have been repeated outbreaks in wild animals. Epizoötic fox rabies was reported in Massachusetts in 1812, in Alabama in 1890, and in Alaska in 1915. During the past seven years, there have been repeated epizoötics of fox rabies in Alabama, Georgia, Louisiana, Mississippi, and North and South Carolina. Sporadic cases of fox rabies have been identified in Arkansas, California, Illinois, Iowa, Indiana, Kansas, Kentucky, Maryland, New York, Pennsylvania, Ohio, Tennessee, Texas, Virginia, West Virginia, and Wisconsin during this same period. Epizoötic skunk rabies was reported in Kansas in 1875, and in Arizona in 1907. Epizoötic coyote rabies was reported in northern Mexico in 1892, in Ne-

vada, Oregon, and California in 1915, and in New Mexico in 1943. Thus, although the large majority of rabies cases occurs among dogs, the presence of rabies in wildlife species complicates the control of the disease.

The statistics on rabies collected by the Bureau of Animal Industry of the United States Department of Agriculture have been made available to this committee through the courtesy of the chief of the Bureau, Dr. A. W. Miller. This information was obtained by means of a questionnaire sent annually to the directors of state public health and livestock sanitary departments. The reporting of animal rabies cases is limited almost entirely to those diagnosed by laboratory examination, and the true incidence is probably much higher.

TABLE 1—Reported Cases of Rabies in the United States, 1938-1944

Year	Dogs	Cattle	Horses	Sheep	Swine	Cats	Goats	Other animals	Man	Total
1938	8,452	413	32	164	42	207	11	44	47	9,412
1939	7,386	358	36	17	38	269	10	172	30	8,314
1940	6,194	326	25	53	71	260	4	277	28	7,238
1941	6,648	418	39	68	159	294	9	212	30	7,877
1942	6,332	288	15	48	32	250	12	160	28	7,165
1943	8,515	349	35	45	60	316	19	310	41	9,690
1944	9,067	561	32	40	43	419	14	311	53	10,540

Table 1 gives the number of cases of rabies in man and in animals for the years 1938-1944, inclusive. The cases listed under "other animals" consist largely of wild species such as foxes, coyotes, skunks, etc.

Table 2 gives the distribution of rabies by states for the period 1940-1944, inclusive. Table 3 gives the statistics on rabies for man and animals by states for the year 1944.

The information given in table 1 shows that the disease is on the increase, both among domestic and wild animals. Fox rabies is a particularly serious problem.

SEASONAL PREVALENCE

Contrary to the popular opinion that the disease is practically limited to the "dog days" of autumn, rabies is most common in the late winter and spring. Outbreaks of rabies may develop at any season of the year and in any climate. The reason for the high prevalence of rabies in the spring is that stray dogs range the country at this time in search of food and mates.

RABIES IN DOGS

A normal dog that is bitten by a rabid animal may develop rabies in as short a time as ten days, or it may show no symptoms until several months later. In most instances, rabies will develop from twenty-one to sixty days after exposure. The virus is not present in the saliva until the early symptoms of the disease appear.

Rabies in dogs is usually classified as furious or dumb, depending upon the symptoms shown by the animal.

Furious Rabies.—During the early stage of the disease, a dog may appear quite normal and be even more affectionate than usual. Despite its friendly actions the dog will be easily irritated, especially if restrained in any way. If picked up, it will immediately try to break away and, if not promptly freed, will bite savagely. This is usually the way children are bitten, because they will pick up a friendly looking dog and try to hold it when the animal attempts to get away. Restlessness and excitement are other early symptoms that will be shown by the dog. The dog will seldom be still for more than a moment and will snap at flies and chase chickens, cats, and domestic animals. It also will have a tendency to eat sticks, straw, earth, and other indigestible material. After a period of one to three days, the dog may become extremely vicious and will bite any living thing that gets in its way, including its master. The eyes will be glazed and constantly wide open. Often there will be a peculiar howl-like bark. During this stage, the dog will usually wander away from home, roam the countryside, and attack any person or animal it sees. Within a few days paralysis will develop, first shown by a wobbly or staggering gait. Paralysis will then extend until the animal cannot get up. Dogs with this type of the disease usually live several days and may live as long as 11 days after developing symptoms.

Dumb Rabies.—In this type of the disease, the early symptoms consist of sleepiness and melancholia; the dog will try to hide or to get away by itself. These symp-

toms are soon followed by paralysis of the jaw, throat, voice, and leg muscles. There will be no irritability or tendency to bite, but persons may be exposed to rabies by trying to look at the animal's throat or while giving medicine. Animals so affected seldom live more than three days after developing symptoms.

In most cases, rabid dogs show symptoms of both types of the disease, that is, a period of restlessness, excitement, and irritability, during which they appear friendly and unusually alert, followed by rapid progression to paralysis of the dumb-rabies type. Some animals affected with rabies die suddenly without showing any symptoms of illness. In other instances, the first symptom is a convulsive seizure during which the animal may die.

It is to be noted that dogs and other animals suffering from rabies are without fear. Rabid wild animals, such as foxes and skunks, will fearlessly invade farm premises and attack persons, dogs, and domestic animals in daytime. The disease makes them insensible to pain, and blows or gunshot will not frighten them.

RABIES IN OTHER ANIMALS

Both domestic and wild animals affected with rabies exhibit essentially the same types of symptoms as those described for

TABLE 2—Distribution of Rabies by States for the Period 1940-1944, Inclusive

State	1940	1941	1942	1943	1944	Totals
Alabama	202	170	222	137	249	980
Arizona	0	22	36	243	338	639
Arkansas	194	260	233	288	251	1,226
California	398	443	532	742	914	3,029
Colorado	8	69	43	11	1	132
Connecticut	0	3	0	0	0	3
Delaware	4	13	9	6	2	34
Dist. of Columbia	0	1	1	105	146	253
Florida	0	264	268	128	252	912
Georgia	601	545	554	564	619	2,883
Idaho	0	0	2	0	1	3
Illinois	327	1,101	462	582	363	2,835
Indiana	254	272	199	153	304	1,182
Iowa	34	49	51	41	88	263
Kansas	17	27	11	8	75	138
Kentucky	109	302	111	104	73	699
Louisiana	86	61	84	924	996	2,151
Maine	7	1	3	2	1	14
Maryland	2	1	9	114	288	414
Massachusetts	77	31	24	5	0	137
Michigan	715	442	166	294	416	2,033
Minnesota	56	16	1	0	2	75
Mississippi	151	143	217	205	262	978
Missouri	31	1	126	453	312	923
Montana	0	0	0	0	0	0
Nebraska	0	0	1	4	1	6
Nevada	0	0	0	0	0	0
New Hampshire	0	0	0	0	0	0
New Jersey	420	309	187	42	68	1,026
New Mexico	107	129	215	322	72	845
New York State[1]	102	109	64	189	314	778
New York City	118	32	49	14	36	249
North Carolina	389	436	191	252	293	1,561
North Dakota	0	0	0	0	0	0
Ohio	592	500	394	394	479	2,359
Oklahoma	255	259	196	218	337	1,265
Oregon	43	20	4	0	1	68
Pennsylvania	345	244	358	830	904	2,681
Rhode Island	67	8	1	1	1	78
South Carolina	165	251	233	215	172	1,036
South Dakota	0	0	0	2	0	2
Tennessee	486	522	567	534	505	2,614
Texas	392	351	1,109	1,143	950	3,945
Utah	5	0	0	5	16	26
Vermont	0	0	0	0	0	0
Virginia	87	49	55	246	316	753
Washington	74	64	6	0	1	145
West Virginia	156	315	163	168	116	918
Wisconsin	161	42	8	2	5	218
Wyoming	1	0	0	0	0	1
Totals	7,238	7,877	7,165	9,690	10,540	42,510

[1]Not including New York City.

dogs. Cattle and horses are less apt to bite and attack other animals but, due to the natural behavior of these animals, this is to be expected. In contradistinction, rabid domestic cats are apt to be more savage than dogs. This holds true also for wild animals, such as foxes, coyotes, wolves, and skunks.

EXOTIC RABIES

Though in most countries rabies is perpetuated by the natural canine host, in some places the disease has become established in unusual types of wildlife. In the Union of South Africa and in India, the meercat and mongoose have been shown to be important vectors of rabies. More unusual still is the vampire-bat rabies of Mexico, and Central and South America. The vampire bat is the only known host that can act as a true carrier of rabies over an extended period without exhibiting evident illness. The majority of vampire bats that contract rabies evidently die of the disease, following a short interval of infectivity, but some have been shown to be capable of infecting animals over a period of five months without showing symptoms of the disease. The vampire bat subsists entirely on fresh blood, which it laps up after inflicting a superficial, crater-like wound with its sharp incisor teeth. These animals live in caves or hollow trees and normally feed only at night. Their favorite hosts are cattle, horses, and chickens, but where livestock is protected at night, they will enter homes and feed on man. The presence of vampire bat rabies in Mexico, near the border of the United States, makes it necessary to consider this vector because, although this species of bat has not been identified in the United States, it may migrate into this country.

LABORATORY DIAGNOSIS OF RABIES

It is a well-known fact that specific intracytoplasmic inclusion bodies or Negri bodies cannot be found always in brain cells of man and animals dying of rabies. In the absence of these bodies, it is not possible to make a definite diagnosis of rabies by microscopic examination, as the degenerative and inflammatory lesions produced by the virus are not sufficiently characteristic. Therefore, if the microscopic examination of a brain specimen is negative, it is necessary to resort to animal inoculation in order to establish the diagnosis. In the past, the guinea pig and rabbit have been considered the most suitable test animals for this purpose. Since the demonstration that the intracerebral injection of rabies virus into white mice produces a typical and constant infection, the white mouse has become increasingly popular as a test animal. The chief advantages of the mouse for this purpose are the low cost, making it possible to use several animals for one specimen; the relatively short incubation period, ordinarily six to ten days, with street virus; and the consistency of production of inclusion bodies in the brains of mice infected by intracerebral injection with street virus.

A positive microscopic diagnosis is sufficient for the diagnosis of rabies. It has been found that the specific intracytoplasmic inclusion bodies of rabies, when present, are readily demonstrated in smears or impressions of the Ammon's horn of the brain, if stained with Sellers' carbol-fuchsin and methylene blue. This is the most practical of the various staining methods that have been developed, as the stains are dissolved in methyl alcohol and the brain tissue is fixed and stained at the same time. Large-scale animal-inoculation studies of dog brain specimens from animals suspected of having rabies have shown that only about 90 per cent of the proved rabid dogs will have Negri bodies in the brain. The presence or absence of these intracytoplasmic inclusion bodies in the brain of a rabid animal depends to a considerable extent on the duration of the disease before the animal is killed or dies of rabies. When the virus of rabies develops an enhanced virulence, as is the case with fixed virus, the brain cells are destroyed before a characteristic inclusion body can develop. Small inclusion bodies are found in the cytoplasm of brain cells in animals dying of fixed virus rabies, but these are not sufficiently characteristic to make it possible to differentiate them from those that occur in other virus infections. Similar atypical intracytoplasmic inclusion bodies are found often in animals killed during the early stages of street virus rabies. Dogs living less than three days after the onset of symptoms of rabies often are negative for rabies by microscopic examination of the brain. Experimental studies of rabies indicate that dogs with dumb rabies are apt to die be-

TABLE 3—Rabies in the United States by States During the Year 1944

State	Dogs	Cattle	Horses	Sheep	Swine	Cats	Goats	Miscel.		Man	Total
Ala.	175	19	3	0	0	18	0	Mule	1	0	249
								Rabbit	1		
								Fox	32		
								Skunk	1		
								Coyotes	3		
Ariz.	246	52	3	0	5	16	1	Antelope	1	1	338[1]
								Rabbits	8		
								Squirrel	1		
Ark.	181	11	1	0	0	11	0	Not stated	45	2	251
								Rat	1		
								Rabbit	1		
Calif.	854	19	0	0	0	28	4	Fox	1	3	914
								Squirrel	1		
								Coyote	1		
								Opossum	1		
Colo.	1	0	0	0	0	0	0		0	0	1
Conn.	0	0	0	0	0	0	0		0	0	0
Del.	1	0	0	0	0	1	0		0	0	2
Dist. of Col.	131	0	0	0	0	13	0		0	2	146
Fla.	234	11	0	0	1	5	0	Fox	1	0	252
								Fox	60		
Ga.	480	22	1	0	1	48	1	Bobcat	1	5	619
Idaho	1	0	0	0	0	0	0		0	0	1
								Skunk	1		
Ill.	314	6	3	0	4	32	0	Fox	1	2	363
Ind.	245	34	0	2	3	14	0	Fox	3	3	304
								Skunk	6		
Iowa	42	19	4	2	2	9	0	Fox	2	0	88
								Squirrel	2		
Kans.	47	11	1	0	2	10	0	Civet cats	2	2	75
								Fox	1		
Ky.	66	1	0	0	0	4	0	Skunk	1	0	73
La.	875	60	6	0	0	10	0	Fox	40	5	996
Maine	1	0	0	0	0	0	0		0	0	1
								Squirrel	1		
Md.	240	6	0	0	14	10	0	Fox	16	1	288
Mass.	0	0	0	0	0	0	0		0	0	0
Mich.	368	35	3	4	1	4	0		0	1	416
Minn.	2	0	0	0	0	0	0		0	0	2
Miss.	215	15	2	0	0	18	2	Fox[2]	8	2	262[2]
								Skunk	1		
Mo.	287[3]	10	0	0	0	9	0	Rat	1	3	312[3]
								Squirrel	1		
Mont.	0	0	0	0	0	0	0		0	0	0
Nebr.	0	1	0	0	0	0	0		0	0	1
Nev.	0	0	0	0	0	0	0		0	0	0
N. H.	0	0	0	0	0	0	0		0	0	0
N. J.	64	2	0	0	0	1	0		0	1	68
N. Mex.	50	8	0	0	2	3	1	Not stated	8	0	72
N. Y. State[4]	233	47	3	0	0	12	2	Racoon	1	1	314
								Fox	15		
N. Y. City	34	0	0	0	0	1	0		0	1	36
N. Car.	259	9	0	0	0	11	0	Fox	13	1	293
N. Dak.	0	0	0	0	0	0	0		0	0	0
Ohio	428	32	1	1	1	11	0	Not stated	5	0	479
								Wolf	1		
Okla.	305	12	0	0	0	13	0	Civet cat	1	3	337
								Monkey	2		
Ore.	0	0	0	0	0	1	0		0	0	1
Penn.	792	51	0	26	3	28	0	Not stated	2	2	904
R. I.	0	0	0	0	0	1	0		0	0	1
S. Car.	152	4	0	0	0	13	0	Fox	2	1	172

[1]Approximately 50 per cent reported on clinical grounds.
[2]Rabies in foxes in eight counties.
[3]Probably mostly dogs.
[4]Not including New York City.

fore the fourth day of the disease, and less than 50 per cent of the dogs with this type of the disease can be diagnosed by microscopic examination of the brain. Biting dogs, that is, those with furious rabies, are apt to live three or more days after the onset of symptoms, and a positive diagnosis can be made in about 90 per cent of such cases. Therefore, it is evident that it is advisable to hold biting dogs in quarantine rather than to kill them immediately and send the brain to a laboratory for diagnosis. There is a double reason for this. First, it will permit observation for symptoms of rabies that may allow a clinical diagnosis of the disease, and as the mortality is to all intents 100 per cent, if the animal has rabies it will die. Secondly, the longer the animal is allowed to live, the better the chance of obtaining a positive microscopic diagnosis.

METHOD OF OBTAINING A LABORATORY DIAGNOSIS OF RABIES

Animals suspected of having rabies should be submitted for diagnosis whether or not there has been human exposure. This is essential in order to know the extent of the disease. The entire head should be removed by a veterinarian or someone familiar with the handling of rabies specimens. In order to preserve the brain during shipping, the head should be placed in a watertight container, which, in turn, should be packed in a larger receptacle containing an equal mixture of packing and ice. Specimens should be sent by Railway Express, labeled "rabies suspect, rush," and addressed to the nearest laboratory of the State Health Department. If the diagnostic laboratory is located nearby, the entire animal or the head may be taken directly to this place for examination. If delivery is delayed, the specimen should be kept under refrigeration.

THE HUMAN RABIES PROBLEM

Though relatively few people die of rabies each year in the United States, it is still a major public health problem. It is necessary to give the rabies vaccine treatment to approximately 30,000 persons each year. The treatment is complicated by the necessity of giving daily treatments for two to three weeks, which is a time-consuming and expensive procedure. The horrible character of the disease in man and its invariably fatal outcome make it one of the most dreaded of human ailments.

Management of Dog Bite Cases.—Where rabies is present in the community, every biting dog must be suspected of having the disease. The wound produced by a dog bite or scratch should be cleansed thoroughly with soap and water. This will remove most of the saliva, which transmits the infection, if the dog has rabies. Immediately after this first cleansing of the wound a doctor should be consulted as to further local treatment and as to whether the vaccine treatment should be given.

Any dog that has bitten a person should be confined for a period of fourteen days. If the animal has rabies, it usually will die in a few days, and will assuredly succumb within a two-week period. If rabies is present in the community, a veterinarian should be consulted as to whether the biting dog has rabies. If the biting dog is a stray and has escaped capture, local authorities should be notified so that the dog can be caught and held for observation. Even if the dog appears to have rabies, it should not be killed unless this is absolutely necessary. During the early stages of the disease it is often impossible to make a diagnosis of rabies by examining the brain of the animal, but if the dog is allowed to die of the disease, microscopic examination of the brain will usually show quickly whether or not the animal had rabies.

Local and Vaccine Treatment for Persons Exposed to Rabies.—If a person is bitten by an animal and the veterinarian and the physician feel that the animal has, or probably has, rabies, the wound produced by the bite should be treated by a physician as soon as possible. The object of local treatment is to remove or inactivate any virus that may have been deposited in the wound. Shaughnessy and Zichis have shown that, as a local treatment, thorough irrigation with a 20 per cent soft soap solution is preferable to cauterization with fuming nitric acid.

Because local treatment cannot be fully depended upon, and as it usually takes several weeks for rabies to develop in man, it is advisable to resort to vaccination as an added safeguard. The usual treatment consists of 14 to 21 daily injections of vaccine. In rare instances the vaccine fails to prevent the disease.

For persons known or suspected to have been bitten or to have been scratched by the claws, vaccine treatment should be started immediately when (1) the animal is apprehended and presents clinical signs of rabies; (2) the animal is killed and the brain is found positive for rabies by microscopic examination (3) the animal is killed and, though the brain proves negative by microscopic examination, the animal is suspected of being rabid; (4) the person is exposed by a stray animal that escaped or one that can not be identified. The vaccine treatment is rarely indicated where there is no satisfactory evidence of the person having been bitten.

It must be emphasized that when an animal is apprehended after attacking a person and rabies is suspected, the animal should not be killed but should be confined under the supervision of a veterinarian. This is important as the immediate laboratory diagnosis of rabies depends on the demonstration of specific intracytoplasmic inclusion bodies in the brain of the animal, and these are often absent in the early stages of the disease.

RABIES CONTROL PROCEDURES

The actual measures necessary to control rabies are known. It is the manner of organization and the maintenance of the program that require attention. Rabies has gradually become more and more prevalent in the United States because of the lack of a uniform policy and concerted action in combating the disease.

Quarantine measures for dogs can control, and even eradicate, the disease, provided wild animals are not involved in its propagation. Actually, vectors other than the dog have played but a minor part in spreading the disease in this country. Where rabies has become established in wildlife species, it has been possible to control the disease by reduction of the species of wildlife affected.

The best example of the effect of rigid dog-control regulations on the incidence of rabies is the program that made possible the eradication of rabies in Great Britain. The following sanitary procedures were enforced: (1) imposition of a tax on all dogs; (2) seizure and destruction of all ownerless and wandering dogs; (3) destruction of all dogs with rabies or suspected of being or becoming rabid; (4) requirement that all dogs be confined while rabies prevailed and for a period of the longest latency after the last reported case; (5) subjection of all imported dogs to a six-month quarantine period.

This program was generally adopted in 1889 but was not satisfactorily enforced until 1897. The disease decreased gradually in prevalence and by 1903 disappeared completely. Rabies was again introduced into Great Britain in 1918 by a dog or dogs illegally imported. By 1922, Great Britain was again free of rabies and no further outbreaks have occurred.

There has been considerable criticism of the six-month quarantine provision. It is therefore of interest to note that 16 cases of rabies in quarantined dogs were found during the period 1919-1939 in Great Britain. Four of these animals developed rabies four to six months after entry, and 1 dog that was held for an additional period because of possible exposure developed rabies six months and twenty-four days after arriving on the Island.

Rabies has been eliminated repeatedly from many communities in the United States, only to be reintroduced. It is therefore necessary to develop a coördinated control program if we are to make any headway in eliminating the disease in this country. The rabies-control program in Great Britain was coördinated through the Ministry of Agriculture. This is true also for the Dominion of Canada, where rabies has ceased to be a problem although the disease has been reintroduced from time to time by entry of dogs from the United States. New cases of suspected rabies are reported promptly, and quarantine regulations are enforced immediately and continued for six months after the last reported case of rabies.

At present, rabies control on a state-wide basis is under three types of administrative setup: (1) under the jurisdiction of the State Department of Public Health; (2) under the jurisdiction of the State Department of Agriculture, Live Stock Sanitary Division; (3) administered as a joint project of the State Department of Public Health and the State Department of Agriculture.

For the most part, rabies-control work is conducted on a municipal or county basis under the authority of the city or county

board of health, and the work is maintained only as long as the emergency persists.

Most officials engaged in rabies-control work favor the development of a national program of rabies control by the United States Department of Agriculture, Bureau of Animal Industry. The disease is an interstate problem and the reporting of rabies cases and the work of rabies control must be coördinated through some national agency. Since it is maintained solely among animals, the disease is essentially a veterinary problem.

Rabies in animals should be reported to some central authority promptly. Past experience has shown that the disease is apt to be of epizoötic proportions in a given locality before the state authorities responsible for rabies control are aware of the outbreak.

No rabies-control program can succeed unless there is adequate provision for a constantly functioning dog pound and for veterinary personnel to investigate new cases of rabies, impound biting dogs, enforce destruction or prolonged quarantine of dogs exposed to rabies, and effect elimination of stray dogs.

Dog owners should be responsible for financing dog-pound work. They are the source of the problem, and it is very difficult to obtain funds for this work without taxation and licensing of dogs. Licensing of dogs allows collection of data as to the number of dogs in a given locality and shows the ownership of a dog by the attached license. It also secures some reduction of the total number of dogs, especially those that are apt to breed indiscriminately. It limits the ownership of dogs largely to those who will take care of the animals and assume responsibility for their actions.

It is necessary to have the coöperation of the public in any scheme of rabies control. This can be best obtained through an educational program. New cases of dog rabies should be publicized in the press so that the public will be cognizant of the disease. Informative articles on rabies and its control should be released to the press by enforcement authorities. Pamphlets on rabies, giving the basic information about the disease and its control, as well as pamphlets on the care of dogs and responsibilities of dog owners, might be distributed to dog owners at the time they receive the dog license or at vaccination clinics. These pamphlets should be available to practicing veterinarians and to civic organizations. Posters can also be used to advantage.

The traditional rabies-control program is one that requires strict quarantine for all dogs for a period of six months after the last reported case of rabies. It is difficult to enforce adequately such a provision in most parts of the United States. It is usually necessary to maintain the quarantine for an extended period. In most instances this has failed to eliminate the disease because the public has failed to coöperate.

In recent years, some communities have been able to eliminate rabies in a few months by a program of vaccination of all dogs, in conjunction with the collecting and impounding of stray dogs and the enforcement of a short quarantine period to facilitate this work. There has been criticism of the value of vaccination as a means of preventing rabies. Recent studies have shown that commercial, canine rabies vaccines are effective immunizing agents. The Bureau of Animal Industry of the United States Department of Agriculture now requires that all commercial rabies vaccines must pass a prescribed potency test. This has led to improvement in methods of manufacturing vaccine, and a superior and more uniform product is now available. Experimental studies have shown that a single subcutaneous injection of 5 cc. of vaccine will confer a high degree of immunity in dogs, and this immunity continues at a significant level for at least a year after vaccination. Three weekly injections produce a more solid immunity and should be recommended to dog owners, but this is not a practical method for mass immunization of dogs. It is evident that rabies cannot be maintained among a group of dogs vaccinated by the single-injection method. Field experience has shown that the disease can be eliminated from a community if all dogs are vaccinated by this method and if unvaccinated dogs found at large are impounded.

Given a situation where the state official responsible for rabies control is notified promptly of all new cases of rabies as soon as a positive laboratory diagnosis is made, this official can declare the existence of the disease in any given locality, and can apply control measures over an area sufficiently wide to be effective.

A thirty-day quarantine for all dogs, so as to facilitate the impounding of stray dogs and the vaccination of owned dogs, should be required. Owned dogs should not be allowed at large until thirty days after vaccination. Vaccination could be carried out on a voluntary basis, whereby vaccinated dogs may have their freedom after a designated period, but dogs, whose owners do not wish them vaccinated, must be kept confined until three to six months after the last reported case of rabies.

The control of rabies among wild animals depends upon an organized campaign to reduce the number of the affected species until the disease disappears. The United States Department of Interior, Division of Predatory Animal Control of the Fish and Wildlife Service, is now prepared to supervise any such program.

RECOMMENDATIONS FOR THE CONTROL OF RABIES IN THE UNITED STATES

Organization.—(1) In order to have an effective program of rabies control in the United States, such a program must be coördinated through some national agency. In view of the fact that the disease is maintained solely in animals, primarily the dog, control work is strictly a veterinary problem. It is therefore recommended that the United States Department of Agriculture, Bureau of Animal Industry, be given authority to coördinate and supervise rabies-control work. The actual control work would then be carried on in coöperation with each State Department of Agriculture, Live Stock Sanitary Division. The presence of rabies in wild animals in certain sections of the country requires the participation of the United States Fish and Wildlife Service of the Department of Interior and state wildlife agencies. The United States Public Health Service and state departments of public health have a direct interest in the rabies problem, and all of these agencies should participate in the planning and enforcement of the control program.

2) Rabies-control work on a state basis should be under the supervision of a full time veterinarian.

3) Rabies in animals should be made a reportable disease, new cases to be reported immediately to the veterinarian in charge of rabies control, and to be reported weekly through regular reporting channels to the United States Department of Agriculture, Bureau of Animal Industry. All diagnostic laboratories engaged in rabies diagnosis should report promptly all positive cases of rabies to the state veterinarian in charge of rabies control. The heads of all domestic and of all wild animals suspected of having rabies should be submitted for examination, regardless of whether or not there was human exposure to the disease.

4) Wherever rabies is found to exist in wildlife species, the state authority responsible for rabies control should notify the United States Fish and Wildlife Service and the State Wildlife Department, and with them arrange a coöperative control program.

5) The organization responsible for rabies control should promote an educational program so as to inform the public concerning the hazards of the disease and the measures necessary to its control.

Control Methods.—(1) Taxation and licensing of dogs is recommended as the most effective means for insuring enforcement of rabies-control regulations.

2) Vaccination of dogs, combined with other dog-control provisions, appears to be the most satisfactory method for securing prompt recession of the disease.

3) It is recommended that a strict quarantine of all dogs be enforced for a period of thirty days, as soon as rabies appears in a community.

4) Vaccination of all dogs, or confinement until the area is officially certified free of rabies, should be required. Vaccinated dogs, properly tagged, may be allowed at large thirty days after vaccination.

5) Vaccination should be done free of charge in order to obtain maximum coöperation. A single subcutaneous injection of 5 cc. of an approved vaccine should be required, but dog owners should be advised that a course of 3 weekly injections of vaccine will produce a more certain immunity to rabies.

6) Dogs under 6 months of age are particularly susceptible and not readily immunizable. These should be kept confined until the area is officially certified free of rabies.

7) Biting dogs and suspected rabid dogs should be impounded for a period of at least fourteen days. Dogs known to have

been exposed to rabies must be destroyed or kept confined for six months.

8) Adequate provision for enforcing the quarantine must be arranged so that unvaccinated dogs and stray dogs will be picked up promptly throughout the control program. Otherwise the methods of rabies control given above will not be successful.

9) The control program should be continued for at least ninety days after the last reported case of rabies. Investigation of each new case of rabies and contact cases is essential.

10) If rabies becomes established in wild animals, it is necessary to carry out a program of reduction of the number of the affected species until the disease disappears. It is evident that the heads of animals taken in this type of program should be examined for rabies so as to determine the incidence of the disease and when it has abated.

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War Dog Statistics

Up to Dec. 1, 1945, the Quartermaster Department, U. S. Army, recruited 19,400 dogs of which 18,000 were donations and 1,400 recruited independently to fill emergency requirements. Of these, 8,400 (as of Dec. 1, 1945) have been discharged.

Fifteen regularly organized War Dog Platoons saw active duty in the theaters of operation, and five more were awaiting sailing orders when hostilities ceased. Two of the platoons fought with the Sixth Army from New Guinea to Okinawa. One of these, in continuous service for thirteen months, assisted in 800 patrols. A dog unit patrolled the bleak Aleutians until the threat of Japanese invasion was blasted. Besides, quartermaster-trained sled dogs assisted the air service in rescuing fliers stranded by forced landings.

Lt. Gen. Edmund B. Gregory, the official pioneer of the Army's first dog service, is sympathetic to the use of war dogs.

Boiled Down to a Few Words

Written indelibly into the pages of history is the fact that civilized man lives on and from the soil and that no civilization can endure unless it is supported by an enduring soil. . . . Any agricultural program which will maintain soil fertility must include livestock production; reasonable freedom from disease is a prerequisite of livestock production; and healthy livestock can be maintained on American farms only if our job as livestock leaders and veterinarians is done efficiently.—*Chief B. T. Simms in the Breeder's Gazette.*

The Food and Agricultural Organization of the United Nations has already swung into action. Its purpose is not to deal solely with the afflicted millions of the present time but to raise levels of nutrition and standards of living among all people in all future times, by improving food production and distribution. You shall know it by the initials FAO which ought to appear often in veterinary literature.

—*Courtesy of De Laval Monthly*

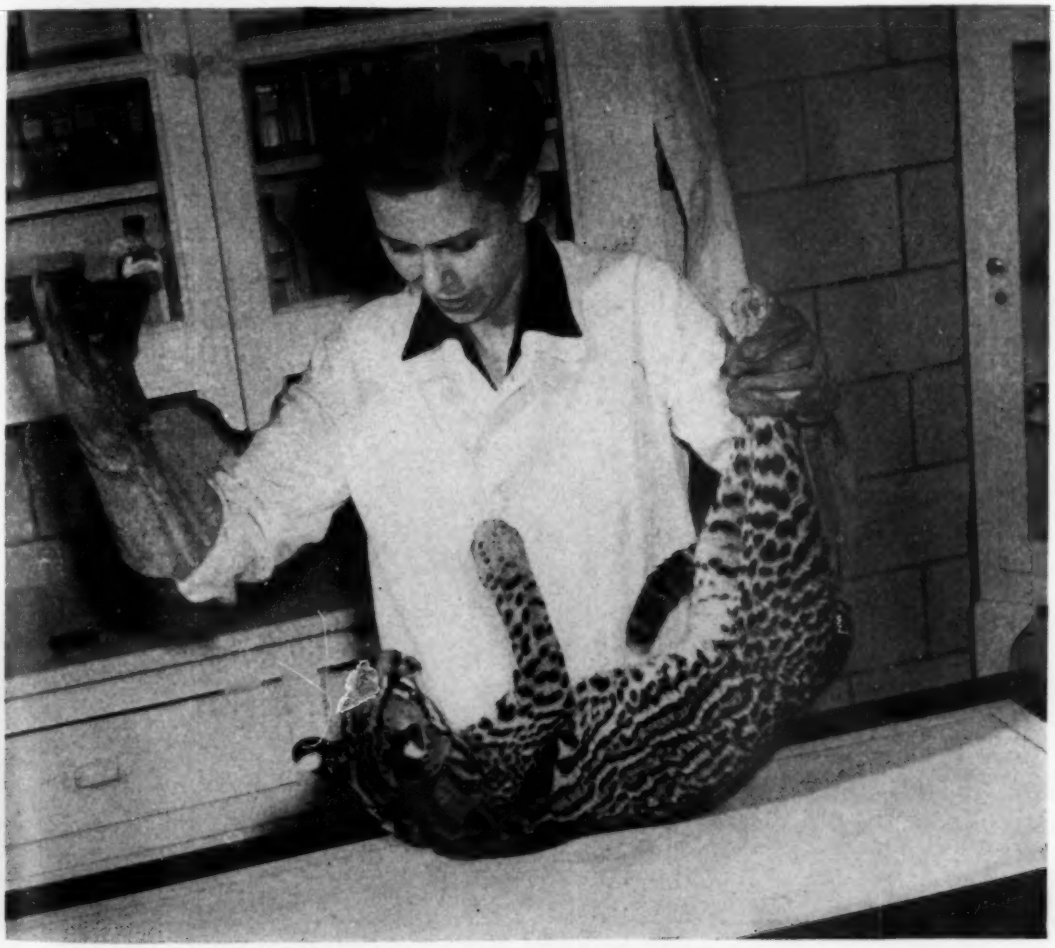
Soldiers in the U. S. Army of Occupation taking courses in agriculture at a German college under American instructors. The instructions include gardening, farming, livestock, and poultry.

Veterinary Service in a Zoo

PATRICIA O'CONNOR, D.V.M.
Staten Island, New York

LIKE ALL zoölogical societies, our organization seeks publicity in every shape and form in order to maintain its attendance records at a high peak. Unfortunately, I am frequently the unhappy victim of such publicity. The accompanying pictures would seem to indicate that a zoo veterinarian's job is something like that of a circus performer. On the contrary, however, the work here is quite serene; only rarely is one called on to treat sick animals. Sometimes, a period of two or three weeks will elapse without a single animal requiring treatment. We attribute this good fortune to diet and rigid enforcement of quarantine, prophylactic, and sanitary measures.

The Staten Island Zoo is located in Richmond, the smallest of New York's five boroughs. The zoo building, most modern and well equipped, is in the shape of a "T". In the front wings are housed the birds and mammals; the reptiles are in the rear wing.



—Acme Photo

Wearing thick leather gauntlets, Dr. O'Connor, veterinarian of the Staten Island Zoo, Staten Island, N. Y., examines an ocelot for signs of feline distemper. Utterly fearless, Dr. O'Connor first calms her patients by administering a sedative or narcotic in their food or water. One of the operations she performs is removal of the scent glands from skunks.

The tropical fish aquarium is in the center rotunda and above it are the offices, library, hospital, laboratory, and study rooms. A large part of the building is given over to recreational and educational facilities. These include an auditorium with a seating capacity of 400, three class rooms, and a mortuary freezer.

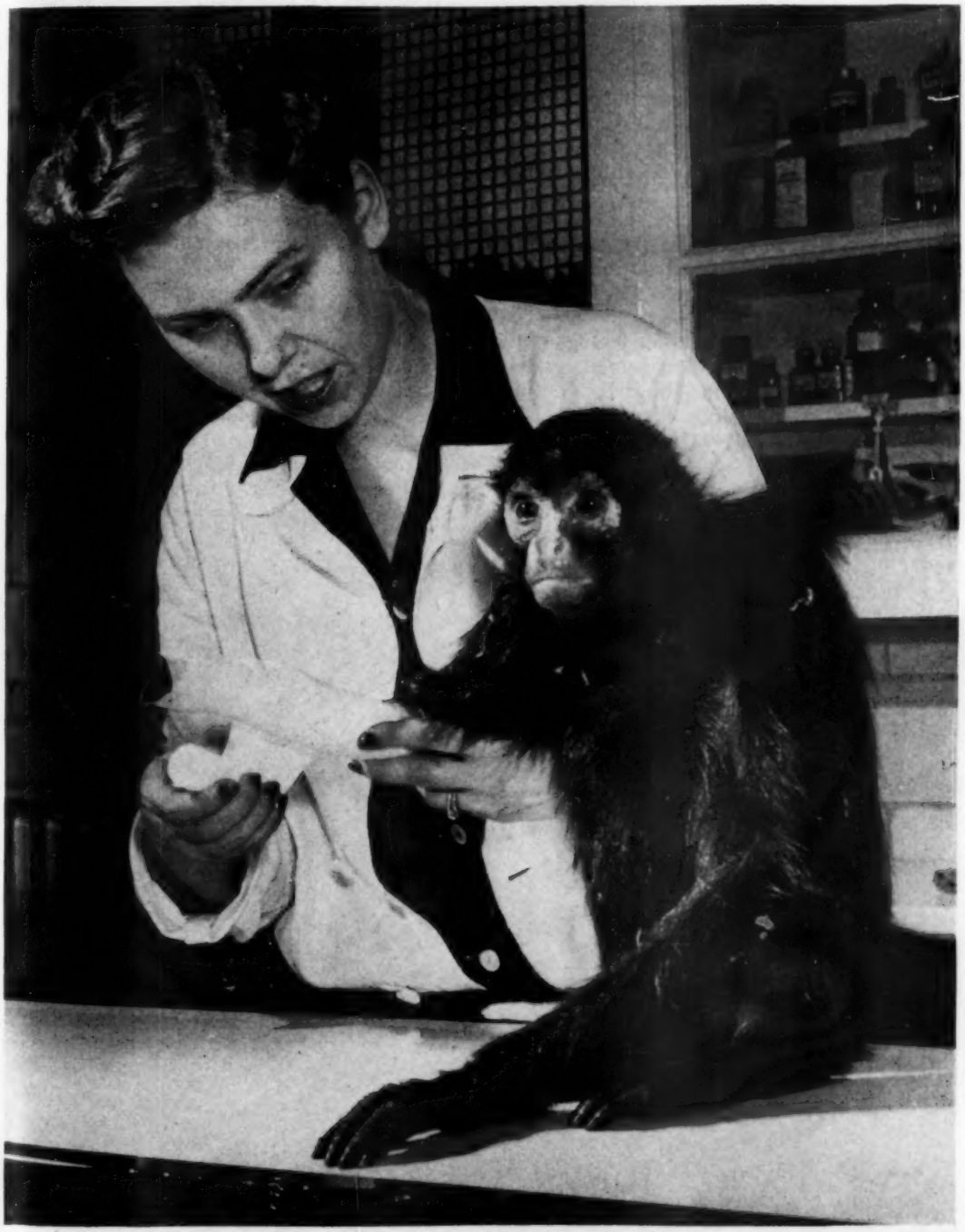
Inasmuch as this institution is only ten years old—a mere infant among zoos,—our experience is naturally limited. We try to keep accurate records on every animal which enters the zoo, including date of arrival, collecting data, duration of quarantine, physical examination, illnesses and treatments, date of death, and autopsy findings. In this way, statistics can be tabulated to demonstrate certain facts, namely: life expectancies, proper diets and major causes of deaths of our captive animals.

It is believed that wild animals survive longer in captivity than in their native habitat since they need not hunt for food, they are protected against their natural enemies, and are cared for in their old age. Longevity records are constantly being recorded by zoos.

Diets form a large problem for the veterinarian, especially during the last few years when many items were difficult to obtain, to say nothing of the limited funds available for food. I am not in accord with the opinion that the diet for a captive animal should be identical with that of the wild state. In a different environment, where exercise is curtailed, the food requirements will naturally be altered. Except for the feline species, all of the mammals

—Acme Photo

A chimpanzee with an infected tooth obligingly points out the offending molar as it is prepared for extraction. According to Dr. O'Connor, chimpanzees make the best patients. They will take pills and liquid medicines obediently, and when they have colds, they sniff a cloth saturated with camphor and oil of eucalyptus.



—Acme Photo

A spider monkey sits patiently while Dr. O'Connor treats his injured arm. Despite their acrobatics, monkeys suffer few external injuries. Tuberculosis is the predominant disease in the ape family and all new monkeys are tested with tuberculin before being placed in the zoo.

are fed dog pellets which contain some 20 ingredients and are claimed to be a complete diet. However, we add supplements of fresh fruit and vegetables, and cod liver oil in some cases. A few months after the introduction of the pellet ration, many of the animals show a noticeable improvement in coat. The feline species and carnivorous birds and alligators are fed government inspected horsemeat slaughtered at a nearby plant. Pregnant and juvenile animals, naturally, require special diets. The reptile and bird diets are somewhat detailed so that no general statement can be made concerning them. The greatest dietary problem seems to be to prevent the keepers from overfeeding their charges. In the limited cage space, the overfed animal tends to become fat and sluggish.

The study of the major causes of deaths among our zoo animals is immensely interesting. Routine postmortem examinations are made on every specimen which dies and the lesions recorded on the autopsy forms. Even when the cause of death is quite obvious, such as being killed by cagemates, examination is made for pathologic changes. An attempt is made to arrange these causes of deaths in our zoo animals according to the human "International List of Causes of Deaths", with some of the titles modified to meet our needs. Upon inquiry, I have learned that only a few zoölogical institutions record the number of deaths which occur annually and fewer still conduct postmortem examinations. Each of these zoos emphasize the reduction in mortality rate as a major consideration. It is erroneous to place too much emphasis on mortality since there are so many contributing factors to be considered. For example, there will be fewer deaths when a collection has remained relatively stable since the specimens were adjusted to their environment, and, due to age, are more or less immune to diseases of infectious origin. On the other hand, several animals in a given collection may have reached the limit of their life expectancy within the same year, and thereby cause a sharp rise in the death rate. There is bound to be a greater number of deaths in a collection that is con-

—Acme Photo

The binturong, an Asiatic civet cat, is one of the most appealing charges in the Staten Island Zoo. Here it seems to be expressing gratitude after having had its leg put in a splint by Dr. O'Connor.

stantly changing because of failure to become adapted, changes of diet, fighting with cagemates, and other causes.

If all zoos which favor autopsy records could be persuaded to inaugurate and adhere to a uniform system of identifying and recording their findings, genuine progress could be achieved in the knowledge of pathology among captive animals. In my opinion, the visible lesions do not in every case seem to be responsible for death and in such cases, I believe, the lesions should be listed and the cause of death should be recorded as "unknown". Unless each participant is willing to acknowledge that many autopsies fail to reveal a cause of death, the statistics will be valueless.

In order to diagnose and prescribe intelligently for zoo animals, a veterinarian must first become acquainted with the habits and peculiarities of the various species represented in the collection. Symptoms which would be cause for alarm in domestic animals are natural reactions in some wild species. The lethargy exhibited by the reptiles is indicative of good health, whereas in a warm-blooded animal it would be a symptom of illness. The bald, scabby condition of the Maribou stork's head is not a skin condition but the natural appearance of the bird. The slender bodies of the ringtail monkeys do not indicate malnutrition, but the physical appearance of that species. It is also necessary for a veterinarian to cultivate the confidence of the keepers who are in daily contact with the animals. These men have a keen sense of judgment of when their charges are

—Acme Photo

Here Dr. O'Connor inspects the wing of a Maribou stork. One of her regular duties is to trim the talons and beaks of captive birds.

"ailing" and report any signs of inappetence, constipation or diarrhea, salivation, discharges from the eyes or nose, lethargy, or excitability.

At the first evidence of ill health the animal is taken off exhibition and placed in a cage in the zoo hospital for observation.

Struggling with an animal to control it in order to give medical or surgical treatment often does more harm than can be offset by the treatment. If treatment is imperative, an animal can be completely or partially anesthetized by placing a narcotic or sedative in its food or drinking water. Medicine can likewise be given in this manner without arousing an animal's suspicions.

The talons and beaks of many of the birds grow rapidly in order to be adequate for their function in the wild, but under captive conditions there is no chance for them to be worn down, so these must be trimmed occasionally.

Surgery is limited to removing tumors, suturing wounds, reducing fractures, draining abscesses, extracting teeth, removing

—*Acme Photo*

Dr. O'Connor allows an alligator to slide back into its pond after inspection. The sluggishness and lethargy of reptiles, though disappointing to zoo visitors, are indicative of good health, according to Dr. O'Connor.

scent glands from skunks and, very rarely, an ovariectomy or cesarean section.

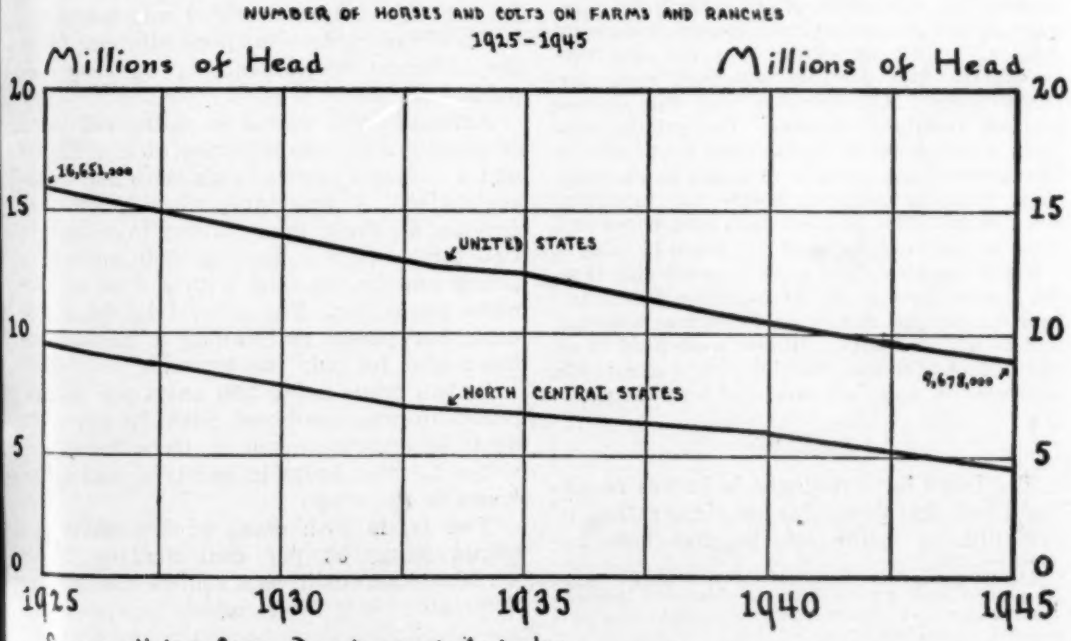
Rodents and marsupials seem to have a higher incidence of tumors than do the carnivores and primates. Kidney tumors are encountered frequently in birds, especially the parrots. At present, all of the tumors found in our specimens are preserved and sent to the Registry of Veterinary Pathology at the Army Medical Museum, in Washington, D. C., which is making a collection of neoplasms from both domestic and wild animals.

Infections and parasitic diseases do not extract a high toll among our collection because we have been able to take advantage of the progress in immunology and obtain vaccines for various infections to which our specimens are susceptible, such as canine distemper, feline enteritis, fox encephalitis, fowl pox, and others. Diagnostic tests have eliminated tuberculosis from our collection. The animals are examined for parasites, both external and internal, during their quarantine period and treated accordingly. Fecal examinations are made at periodic intervals after the specimens have been placed on exhibition.

Biology classes held at the zoo come under the direction of the veterinarian. They consist of high school and college students who attend voluntarily. The classes witness autopsies, do individual dissections, prepare skeletons, and hold discussions relative to biology. When possible, they are allowed to observe animals being treated, during which time the illness and the treatment are explained to them. Advanced students do individual work such as preparing and inoculating culture mediums, bacteriologic examinations, blood and urine analysis, and sectioning and staining of normal and pathologic tissues. These services all assist in the making of an accurate diagnosis.

Of the approximate one hundred zoos in the United States, less than 10 per cent employ full-time veterinarians. While veterinary service in zoos is somewhat limited, it offers an interesting field. With his training in nutrition, animal hygiene, diagnosis, therapeutics and pathology, no one is better fitted than a veterinarian to contribute to the field of zoölogical research.

The Twenty-Year Trend in the Horse Population



Source - United States Department of Agriculture

Note that the decline was steady during the whole twenty-year period for the whole country, but slowed up during the last ten years in the farming states.

Efficacy of Various Agents for Delaying Absorption of Penicillin

E. R. DOLL, M.A., D.V.M., and W. W. DIMOCK, B.S., D.V.M.
Lexington, Kentucky

THE RAPID disappearance of penicillin from the blood when given parenterally in aqueous solution has stimulated considerable interest in methods of administration that would delay absorption or excretion. The obvious advantages of such methods are the longer intervals between dosage and the smaller quantity of penicillin required for maintaining a blood level of sufficient concentration to be therapeutically effective. In this report, blood levels resulting from the combination of various agents for delaying absorption with saline solutions are given, and their efficacy compared with results obtained with saline solutions of penicillin.†

MATERIAL AND METHODS

The procedure for determination of the blood level has been described in a previous report.[1] All preparations of penicillin contained 5,000 units per cubic centimeter, and all were administered intramuscularly. The various concentrations of adrenalin or neosynephrin were made by adding the requisite amount from solutions of 1:1,000 adrenalin or 1 per cent neosynephrin. The dextrose solutions were prepared from U.S.P. dextrose and the sucrose solution from C.P. sucrose. The gelatin solutions were prepared from Difco bacto-gelatin. The preparations used were added to the penicillin vials immediately before the injections were made. The combinations and concentrations of the vehicles used are given in table 1.

Blood samples were drawn aseptically from the jugular vein at 15, 30, and 60-minute intervals during the first hour following injection, and hourly thereafter. Horses were used in all of the dosage trials. The doses were accurately measured in units per pound of body weight.

RESULTS

The blood level response in horses resulting from intramuscular administration of penicillin in saline solution has been reported previously.[1] The period of detectable blood level from equal doses per pound is somewhat variable, there being a range of time over which an effective blood level is maintained by a given dose. When using saline solutions by intramuscular injection, doses of 100 units per pound resulted in a blood level which is detectable for one hour following injection, while 200 units per pound produced a blood level which persists for an average of two hours. With doses of 300 units per pound, the detectable level persists for an average of about two and a half hours, and with 500 units per pound the time is approximately three hours. The smallest quantity of penicillin detected by the test was 0.0097 unit per 0.5 cc. of serum.

Neosynephrin was added to saline solutions of penicillin in concentration of 1 : 2,500, 1 : 5,000, and 1 : 10,000 in two trials with each concentration. A detectable quantity of penicillin was present in the blood at three hours in only one trial (table 1). No significant difference was noted between different doses of penicillin nor from the different concentrations of neosynephrin.

Adrenalin was added to saline solutions of penicillin in concentration of 1 : 25,000 and 1 : 50,000 in two trials with each concentration. A detectable blood level was present at three hours after injection in two trials with a dose of 500 units per pound and in one trial with a dose of 300 units per pound. The other trial with 300 units per pound maintained a measurable blood level for only two hours.

In two trials using 300 units per pound, penicillin was combined with 50 per cent dextrose and the resulting blood level persisted for two hours in one trial and three hours in the other.

Two trials with doses of 300 units per pound using 50 per cent dextrose with 1 : 50,000 adrenalin as a vehicle, resulted in detectable blood levels which persisted for

The investigation reported in this paper is in connection with a project of the Kentucky Agricultural Experiment Station and is published by permission of the director.

†The penicillin used for this investigation was courteously supplied by Merck and Company, Inc., Rahway, New Jersey.

[1]Doll, E. R. and Dimock, W. W.: Penicillin Dosage and Blood Levels for Horses. J.A.V.M.A., *108*, (April, 1946): 209-214.

TABLE I—Serum Levels Resulting from the Combination of Various Agents with Saline Solutions of Penicillin.

Wt. (lb.)	Dose: units per lb.	Total dose (units)	Vehicle	Unit per cc. of serum at specified time intervals following injection Hours 0.25	0.50	1.00	2.00	3.00	4.00
350	500	175,000	Saline + neosynephrin 1:2,500	0.62	0.62	0.155	0.077	0.00	0.00
1170	200	234,000	Saline + neosynephrin 1:2,500	0.31	0.31	0.155	0.077	0.00	0.00
740	300	222,000	Saline + neosynephrin 1:5,000	0.077	0.155	0.155	0.038	0.00	0.00
860	300	258,000	Saline + neosynephrin 1:5,000	0.077	0.155	0.077	0.019	0.00	0.00
620	300	186,000	Saline + neosynephrin 1:10,000	0.038	0.077	0.077	0.038	0.019	0.00
820	300	246,000	Saline + neosynephrin 1:10,000	0.155	0.155	0.155	0.038	0.00	0.00
620	300	186,000	Saline + adrenalin 1:25,000	0.077	0.155	0.155	0.077	0.019	0.00
820	300	246,000	Saline + adrenalin 1:25,000	0.038	0.155	0.155	0.038	0.00	0.00
860	300	258,000	Saline + adrenalin 1:50,000	0.00	0.038	0.038	0.038	0.019	0.00
740	300	222,000	Saline + adrenalin 1:50,000	0.038	0.038	0.077	0.038	0.019	0.00
340	300	102,000	50% Dextrose	0.155	0.155	0.077	0.019	0.00	0.00
820	300	246,000	50% Dextrose	0.077	0.155	0.155	0.077	0.038	0.00
820	300	246,000	50% Dextrose adrenalin 1:50,000	0.00	0.00	0.019	0.019	0.019	0.00
340	300	102,000	50% Dextrose adrenalin 1:50,000	0.019	0.038	0.019	0.019	0.019	0.00
350	500	175,000	50% Dextrose adrenalin 1:50,000	0.019	0.038	0.038	0.019	0.019	0.019
1170	500	585,000	50% Dextrose adrenalin 1:50,000	0.155	0.155	0.077	0.077	0.038	0.019
340	500	170,000	40% Sucrose neosynephrin 1:10,000	0.31	0.31	0.155	0.077	0.038	0.019
820	500	410,000	50% Dextrose neosynephrin 1:10,000	0.077	0.155	0.155	0.077	0.038	0.019
1100	300	330,000	25% Dextrose neosynephrin 1:5,000	0.077	0.155	0.155	0.038	0.019	0.00
1170	300	351,000	50% Dextrose neosynephrin 1:5,000	0.155	0.155	0.155	0.077	0.038	0.00
350	500	175,000	50% Dextrose neosynephrin 1:5,000	0.31	0.31	0.155	0.038	0.019	0.00
820	500	410,000	25% Dextrose + neosynephrin 1:5,000	0.155	0.31	0.31	0.155	0.038	0.019
340	500	170,000	15% Gelatin + neosynephrin 1:10,000	0.31	0.31	0.155	0.077	0.038	0.00
820	500	410,000	15% Gelatin neosynephrin 1:10,000	0.31	0.31	0.31	0.155	0.038	0.019
1100	200	220,000	15% Gelatin neosynephrin 1:2,500	0.155	0.155	0.077	0.019	0.00	0.00
350	500	175,000	15% Gelatin adrenalin 1:25,000	0.155	0.155	0.155	0.077	0.038	0.00
1170	200	234,000	15% Gelatin adrenalin 1:25,000	0.00	0.038	0.077	0.038	0.019	0.00

three hours. In two trials with the same vehicle and doses of 500 units per pound, the detectable level was maintained for four hours.

Trials with neosynephrin and dextrose produced blood levels which were maintained as follows: 500 units per pound with 50 per cent dextrose and 1 : 10,000 neosynephrin for four hours, 500 units per pound with 50 per cent dextrose and 1 : 5,000 neosynephrin for three hours, 500 units per pound with 25 per cent dextrose and 1 : 5,000 neosynephrin for four hours, 300 units per pound with 25 per cent dextrose and 1 : 5,000 neosynephrin for three hours, and 300 units per pound with 50 per cent dextrose and neosynephrin 1 : 5,000 for three hours.

The combination of adrenalin or neosynephrin with 15 per cent gelatin as a vehicle and doses of 500 units per pound maintained a detectable blood level for three hours in two trials and for four hours in one trial. Doses of 200 units per pound were similarly effective for two and three hours in one trial each.

In one trial, in which 40 per cent sucrose and 1 : 10,000 neosynephrin was used with a dose of 500 units per pound, the blood level was maintained for four hours. This material caused considerable swelling and soreness and was discontinued because of its irritant effect.

The most favorable results were obtained with a suspension of calcium penicillin in oil, containing 100,000 units per cubic centimeter.* In two trials, employing dosage of 300 units per pound, penicillin was present in measurable quantity at four hours following injection. In all of five trials in which a dose of 500 units per pound was used, penicillin remained in the blood serum in detectable quantity at the end of six hours following injection. An irritant effect, evidenced by slight swelling and tenderness, was noted in two instances.

TABLE 2—Serum Levels Resulting from Administration of Penicillin Suspended in Oil

Wt. (lb.)	Dose: units per lb.	Total Dose (units)	Units per cc. of serum at specified time intervals following injection. (Hours)							
			0.25	0.50	1.00	2.00	3.00	4.00	5.00	6.00
850	300	255,000	0.077	0.155	0.155	0.077	0.077	0.019	0.00	0.00
850	300	255,000	0.077	0.155	0.155	0.077	0.019	<0.019	0.00	0.00
850	500	444,000	0.155	0.310	0.310	0.310	0.155	0.077	0.038	0.019
850	500	444,000	0.310	0.310	0.310	0.155	0.155	0.077	0.019	<0.019
1100	500	555,000	0.31	0.62	0.62	0.31	0.077	0.038	0.019	<0.019
830	500	415,000	0.31	0.31	0.31	0.31	0.155	0.155	0.038	<0.019
700	500	350,000	0.31	0.31	0.31	0.31	0.155	0.038	0.019	<0.019

DISCUSSION

No prolongation of the detectable blood level was obtained with the use of neosynephrin in saline solutions. Dextrose in 50 per cent concentration also appears ineffective in delaying absorption. Adrenalin in saline solutions appears to slightly prolongate the period of detectable blood level, averaging about thirty minutes more than for aqueous solutions. Both adrenalin and neosynephrin cause some delay in absorption as shown by lower blood levels during the first hour following injection. As indicated by the blood level response, absorption of penicillin was somewhat erratic when vasoconstrictor drugs were used with saline and dextrose or gelatin solutions as vehicles.

The period of detectable blood level, when using either adrenalin or neosynephrin with 50 per cent dextrose, was prolonged for thirty minutes to one hour over that obtained from straight saline solutions. However, the absorption was erratic and in some trials a therapeutically effective concentration was not obtained in the blood. Erratic absorption appeared more likely to occur following the use of adrenalin. The blood levels following the use of neosynephrin were not significantly variable. Gelatin in 15 per cent solution appeared no more ef-

*This material also was supplied for experimental use by Merck and Company, Inc., Rahway, New Jersey.

fective as a vehicle than dextrose and possesses the disadvantages of being difficult to prepare, requiring warming before use, and being more irritant to the tissues.

Penicillin in oil produced effective blood concentrations which were maintained for four and six hours, respectively, with doses of 300 and 500 units per pound (table 2). Maximum concentrations in the blood serum were reached in fifteen to thirty minutes following injection. The irritant properties of the preparation did not appear to be important. The maintenance of an effective blood level period for equal doses was approximately double that of saline solutions.

SUMMARY

The use of vasoconstrictor drugs, adrenalin and neosynephrin, with saline solutions of penicillin produces only a short prolongation of the effective blood level period in the horse, and offers very little advantage in therapeutic use of the drug.

Concentrated solutions of dextrose caused no prolongation of the detectable blood levels over that obtained with saline solutions. The use of dextrose or gelatin in combination with vasoconstrictor drugs, offers no significant advantage over saline preparations. Erratic absorption and low blood levels following their administration would be distinct disadvantages in therapeutic use of penicillin.

A suspension of calcium penicillin in oil appears to be a satisfactory preparation, having about double the efficiency of saline solutions for maintaining an effective blood concentration in horses.

A serious menace to the cattle industry of Australia has arisen by the acquired resistance of the cattle tick to arsenical dips, says James Mahoney, of Sydney (*Hereford J.*, Mar. 1, 1946). The only relief in sight appears to be DDT, and it is believed to be too expensive for general use, as well as too scarce to be an immediate help in widespread control measures.

Says the *Guernsey Breeder's Journal:* "By feeling the udder of a 4-month-old heifer, you may be able to determine her producing capacity in ten minutes instead of waiting thirty-two months longer."

Mastitis Treatment

A satisfactory treatment for acute mastitis is reported by Dr. Robert Nichols, Fryeburg, Maine. The owner immediately advises Dr. Nichols upon finding a swollen quarter, and it is always treated within a few hours—morning, noon, or night.

Phemernite is injected intravenously (125 cc.), sulfanilamide is administered orally (2 oz.), and sulfanilamide in oil is injected through the teat canal (50 to 100 cc., depending on size of quarter). Aftercare consists of feeding a heaping tablespoonful of powdered sulfanilamide every eight hours for 6 doses, milking the injected quarter at noon on the succeeding day and then several times during the remainder of that day and the next. "Three days is the longest any quarter has taken to produce normal milk. No quarter has been treated twice."

The War Dog in Action

Actual combatants in action against an enemy who's pumping lead at everything that moves are the men from whom one must now gather facts about the utility of the war dog during that phase of military operations. An interview with a wise old sergeant of the South Pacific theater gives some good advice we've never heard before: In effect, war dogs, like war horses, war mules, and warriors, have to be shod to be kept useful. There's a difference, says he, "between the cushiony snow of the Arctic and the cutting rocks and débris of a battle zone."

So far as the G. I. is concerned, someone will have to invent a practical dogshoe, or keep the dogs back at headquarters. One of the sad events of the war, our informant says, was having to abandon a dog in the mountains of Luzon.

A new method of preserving food is suggested by German experiments involving the application of plastic coatings to bread and cheese.—*U. S. Dept. of Commerce.*

In farm practice, phosphorus fertilizers may be expected to cause an appreciable increase in the protein content of the hay grown, if they are applied on soils markedly deficient in this element.—*Exper. Station Rec., December, 1945.*

Field Experience in Public Health for Veterinarians

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THE ADVANCING complexity of society has forced professions, once unrelated, into a maze of interdependency and has exposed the existence of common problems in many. Public health and veterinary medicine are an example. The responsibility which veterinarians should assume in the field of public health has been realized by the veterinary profession for a long time, but little attempt has been made to establish it in this field.

When one considers the host of animal diseases that are transmissible to man—bovine tuberculosis, undulant fever, rabies, equine encephalomyelitis, salmonellosis—, problems which today concern every well-organized health department, and considers, too, that the veterinarian has been trained in the epidemiology of exactly these pathogens, one wonders why rapid advances are not now being made to equip students so that they might participate in regular public health activities.

The idea is evolving, but problems delay its implementation, namely:

(1) At present, the veterinary student has limited opportunity to obtain an understanding of the relation of the public health problem to his profession. The lack exists both in the academic phase of his work and in the absence of planned field experience. If a student should wish to look further into public health, he would find that there is no field training center where he could secure a well-planned field experience in a full-time, regular health department that would be integrated with his academic training.

(2) The solution of certain public health problems can best be reached through the applied skills of the veterinarian. These problems arise from the prevalence of animal diseases transmissible to man. Additional problems arise from the need to protect and safeguard the public supply of meat, milk, and other foods of animal origin.

(3) The veterinarian who plans to enter private practice should have a knowledge of the activities of a well-organized health department so that his service to his clients and to the community would be enriched.

(4) The activities of all veterinarians, with stress upon the contributions that may be made to a well-rounded public health program, should be interpreted to the public health profession.

(5) The veterinary profession should recognize the opportunities for service in public health and the resultant recognition that will come to the profession through this service.

To help provide a limited number of recent graduates in veterinary medicine with an orientation experience in public health, the W. K. Kellogg Foundation, Battle Creek, Michigan, granted three-month fellowships to 8 veterinarians from the June, 1945, class of Michigan State College. Dean Ward Giltner and Dr. C. S. Bryan, of Michigan State College, aided in the development and the setting up of the training program. The following is a brief outline of the summer's work:

June 18—June 30 was considered as a period of orientation and indoctrination. Each division head, namely, health officer, laboratory director, public health educator, supervisor of public health nurses, and director of sanitation, briefly outlined the work of each department. Supervised field visits were made to dairy farms, restaurants, pasteurizing plants, slaughter houses, and the veterinarians were introduced to the county's method of rating these establishments, the instructor emphasizing the importance of observation.

July 2—July 24 was spent in milk sanitation. Each student was assigned to a pasteurizing plant in the county and it was his job to learn all the mechanics of pasteurizing, cooling, storing, and handling in the plant. This was accomplished through the coöperation of milk plant owners. In turn, the student made constant checks on incoming milk through sediment tests, methylene blue tests, and collection of producer can samples. The student became thoroughly familiar with each of the platform tests. Finished pasteurized bottle samples were also analyzed at the County

Health Department Laboratory. The student spent time in the laboratory actually interpreting the results of laboratory tests on milk.

Two and a half days of this period were spent with the county veterinarian* blood-testing animals (for brucellosis) which were to be shown at the county fair in August. Some of these animals had been vaccinated previously and the results obtained were interesting. These are being analyzed.

One day was spent at the Michigan Department of Health, where the students became familiar with the various divisions and their functions. Roadside water samples were collected at golf courses, gasoline stations, roadside parks, etc. in order that the veterinarians might become familiar with the different types of wells and pumps to determine from physical observation whether or not the well was of an approved type.

July 30—August 10 was spent inspecting food establishments including restaurants, taverns, and soda fountains. Each establishment was inspected at least twice. On the initial visit, certain recommendations regarding physical improvement of the establishment were made. On subsequent visits, swab tests were made of the utensils and in certain instances swab tests of meat grinders, food containers, etc., were made in an effort to isolate Salmonella and other pathogens, and to determine bacterial conditions of such equipment. One day was spent with the malaria control officer of the U. S. Public Health Service, district 3; this officer is doing malaria control around Percy Jones General Hospital.

August 13—17.—During this period, each student spent at least one day at a local packing company which is under federal inspection, actually doing some meat inspection under the direct supervision of a federal meat inspector.

August 20—24 included fair week in Calhoun County and the veterinarians were busily engaged in constructing and operating exhibits on milk sanitation with emphasis on the veterinarian's problems. The veterinarians took turns appearing at the booth to answer questions from the farmers in relation to mastitis, brucellosis, and related topics.

*Calhoun County had a county veterinarian at this time.

August 29—September 1.—Through the coöperation of the U. S. Public Health Service, the W. K. Kellogg Foundation, and the Michigan Department of Health, a field trip was made to the Chicago Health Department. The veterinarians became familiar with the U.S.P.H.S. method of surveying a milk shed. The dairy farm surveys were made in the Zeeland area, followed by a field trip through Chicago milk plants, illustrating flash pasteurization. Dr. W. H. Haskell, of the U.S.P.H.S., set up a model foodhandlers' course for the benefit of the veterinarians.

September 4—September 15 included the following activities: (1) The veterinarians set up, administered, and completed the details of a milk survey of the Marshall and Albion Milk Sheds according to the U.S.P.H.S. survey forms.

(2) In order to complete the field of environmental sanitation, each veterinarian inspected the rural schools of one township. They also conducted a short discussion in one rural school on "Animal Diseases Transmissible to Man."

Each Saturday morning was set aside as a discussion period, at which time an attempt was made to solve some of the problems which confronted the veterinarians while working in the field.

The training program was an attempt to utilize community professional resources so that problems might be efficiently and effectively solved by the natural specialists in the field. Provisions for similar experiences for future graduate veterinarians have not yet been made. Perhaps other areas, stimulated by the results of this experiment, may find the inclusion of a field training program in their local public health programs feasible. In any event, the in-service training for both the health department personnel and the veterinary student was valuable in informing members of both professions of the reciprocal services which these two professions might render toward the goal of optimum community health.

The term pantothenic acid ($C_9H_{17}O_5N$), the filtrate component of yeast and liver, was named for its almost universal presence in living matter. It is the constant ingredient of protoplasm, and is supplied commercially in the form of a sodium or calcium salt.

DDT: A Review
With Special Reference to Veterinary Medicine

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IN VIEW of the wide availability of DDT, its value in controlling insect pests and ectoparasites, and the toxic dangers inherent to its use, it seemed desirable to review the literature pertinent to veterinary medicine and attempt to present the current picture of DDT as related to its use in veterinary medicine.

HISTORY

DDT was first synthesized, in 1874, by Zeidler in a search for dye intermediaries. No more was heard about it until 1941 when Geigy Company of Switzerland notified its United States branch that, on the basis of work conducted by Müller, a new insecticide was found effective against the Colorado potato beetle.

In 1942, the active principle was given the abbreviation G.N.B. (Gesarol-Neocid Base), and in 1943 DDT was suggested as an abbreviation.

In 1942, Geigy, U. S., was supplied with "Gesarol dust" containing 3 per cent active ingredient and "Gesarol spray" containing 5 per cent active ingredient, with the information that extraordinary results had been obtained with them as agricultural insecticides.

The Bureau of Entomology and Plant Quarantine of the USDA, at their Orlando, Florida, laboratory, which was set up for the purpose of finding insecticides of military importance, began intensive studies on Gesarol dust and spray, with the support of the National Research Council, the Surgeon General's Office, and the O.S.R.D.*

The composition of the active principle, which up to that time was not known in the United States, was determined by Haller of the USDA, at Beltsville, and was synthesized by him.

When the supply from Switzerland was exhausted, the Cincinnati Chemical Works of Norwood, Ohio, was called upon to manufacture DDT.

At a conference of the O.S.R.D., in May, 1943, a detailed report of the Orlando investigations was made and a louse powder containing DDT was recommended for use in the armed forces. Other preparations were developed for use in mosquito control.

The story of typhus and malaria control in the war is well known and attests to the success of these investigations.

CHEMISTRY

Synthesis.—DDT (2,2 bis(para-chlorophenyl) 1,1,1,-trichloroethane) can be prepared by the condensation of chloralhydrate and monochlorobenzene in the presence of concentrated sulfuric acid.

Properties.— It is a white crystalline powder, tasteless, almost odorless and, in pure form, has a melting point of 107-108 C. It is insoluble in water, moderately soluble in petroleum and fatty oils, and readily soluble in organic solvents.

Assay.—Methods for the assay of DDT in biologic material have been worked out. One is a titration procedure for organically bound chlorine following sodium reduction.[22] Another is a highly specific colorimetric method based on polynitration of DDT and its metabolites.[13]

PHARMACOLOGY

Insect Action.—The pharmacologic action of DDT on the insect is, as yet, not well known; the effect is apparently on the nervous system and is characterized by a short period of excitement, followed by progressive paralysis and death. Death may be delayed as much as twenty-four hours, but eventually occurs.[5]

Absorption.—In animals, skin absorption from the powdered form or from water suspension is apparently negligible. However, absorption through the skin from an oily solution can occur to the extent of producing all the manifestations of toxicity. In-

From the Division of Veterinary Medicine, Minnesota Agricultural Experiment Station, University of Minnesota, University Farm, St. Paul.
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*Office of Scientific Research and Development.

unction of 0.5 cc. of a 30 per cent solution per kilogram (150 mg. DDT/kg. body weight) (1 gr./lb.) per day proved toxic to rabbits, rats, and guinea pigs.[4]

Absorption of the powdered form through the gut, though not great, is nevertheless variable and irregular, probably depending in part on the fat content of the diet. DDT is absorbed to the extent of 50 to 95 per cent of a single dose administered in oil.[22]

Distribution and Cumulative Effect.—DDT has been found in all tissues examined and in the feces.[13] The highest concentrations are present in the bile and fatty tissue.[13,22,31]

The drug is extremely cumulative. One-twentieth of the minimum lethal single dose, when given daily to rabbits, results in death in from fifteen to twenty-five days. Rats, on a diet containing 0.1 per cent, died in from eighteen to eighty days.[22] Cats are especially susceptible to the cumulative action of the drug.[23]

ELIMINATION

Urine.—The urinary excretion of DDT is very slow. DDT can be demonstrated in the tissues fifteen days following a single administration of the drug.[23] Some of the DDT is detoxified in the body to di-(parachlorophenyl) acetic acid (abbreviated DDA[27]) and two other related compounds in much lesser amounts.[13] DDA and DDT have been found in all tissues and in urine by Ofner and Calvery, but only DDA and two lesser metabolites were found in uncontaminated catheter urine.

Feces.—From 5 per cent to 50 per cent of a single dose administered in oil is eliminated in the feces of rabbits. The variation depends on the dose administered, with a larger portion being absorbed in the smaller doses. Some of the eliminated DDT represents excretion of the drug in the bile and intestinal tract, as well as that which is unabsorbed.[23]

Milk.—The problem of DDT excretion into the milk, and its concentration in the cream and butter, is of great importance to the nursing animal and to human health. Lactating dogs, receiving DDT by mouth, have secreted milk containing appreciable levels of the drug.[31]. DDT has been found to be eliminated in toxic amounts in the milk of goats following a large, single, oral dose (0.68 to 1.25 Gm./lb.).[32] Toxic symptoms and death occurred in rats in from twenty-nine to thirty-one hours after one feeding of the milk which remained toxic for approximately one week after the single DDT dose.

Cream was found to be more toxic than skimmilk, which is to be expected from the high lipid-water distribution ratio of DDT.

Laboratory-raised flies were also exposed to milk and butter from the treated goats. All the flies were down within two and a half hours.

TOXICOLOGY

DDT is poisonous to man and lower animals. There are wide individual, as well as species, differences in the toxicity to DDT. The l.d.$_{50}$* in rats when DDT is given as a single dose in oil is 150 mg. per kilogram (1.0 gr./lb.) and in rabbits is 300 mg. per kilogram (2.0 gr./lb.).[22] On a comparable basis, therefore, DDT is three times more toxic to rats and two times more toxic to rabbits than is phenol.

Symptoms.—In general, the toxic syndrome consists of anorexia and generalized disturbance of the nervous system, characterized by local and generalized tremors, paralysis, convulsions, and death. It has already been mentioned that the absorption of repeated doses leads to accumulation and intoxication, even though the dose is small.

In domestic animals, anorexia is uniformly produced. Cows on levels of 100 to 200 mg. per kilogram per day (2/3 to 1 1/3 gr./lb.) of dry DDT in capsule develop marked tremors and become hyperexcitable.[15]

Chickens show hyperirritability and gross tremors when fed 500 to 1,000 p.p.m. in the diet (0.05 to 0.1 per cent) for six to ten days.[12] Cats show persistent extensor rigidity with muscular twitching, especially of the head and neck, which may persist for several days following a single dose.[23]

Laboratory animals subjected to exposure by inhalation of DDT dusts show only slight reactions. Mice appear to be more sensitive in this respect. Dogs tolerated comparatively large doses of pure DDT by intranasal insufflation.[11]

Lesions.—The most constant findings at autopsy, in the various species, are liver lesions. This is interesting in view of the similarity in structure between DDT and other chlorinated hydrocarbons, such as

*Single dosage required to kill 50 per cent of the animals on experiment.

carbon tetrachloride and chloroform which produce similar liver alterations at toxic levels.

Hepatic hyaline degeneration, vacuolization, and focal hydropic degeneration are found in rats and rabbits following toxic dosages. Varying degrees of fatty degeneration of hepatic cells and areas of coagulation necrosis are reported in cats, rats, and rabbits.[8] In addition to the above, striated muscle necrosis in one rabbit and myocardial necrosis in guinea pigs and rabbits have been observed.[12]

Lesions observed in large domestic animals have been relatively slight. In cows, the lesions were variable. Macroscopic hemorrhages in the subendocardium, in the left ventricle, and in the wall of the small intestine were noted, as well as slight fatty degeneration of the liver. In one cow, an atrophic spleen and mild focal necrosis of voluntary muscles was seen.[15]

Twenty-one days following the last dose of a series given to a horse over a three-week period, Orr and Mott observed extensive, old, dark hemorrhages in the wall of the left ventricle and stomach. The kidneys were friable and congested.

Upon autopsy eighteen days following the administration of the last daily dose of a one to three-week series, 3 sheep had scattered hemorrhages in the intestines and 2 sheep showed cardiac valvular hemorrhages.[15] Four sheep, although developing paralysis, tremors, and slight diarrhea, survived a dose in powdered form of 2,000 mg. per kilogram (13 1/3 gr./lb.).[12] One of these sheep showed slight central necrosis of the liver.[15]

Although severe neurologic symptoms are uniformly produced, the microscopic lesions found in the c.n.s.* are usually slight. Vacuolization around some of the large nerve cells of the cord and cerebral nuclei has been observed in cats, rats, and rabbits, with tigrolysis and cell vacuolization in cats and rats.[8]

In chickens, despite severe neurologic symptoms, microscopic lesions of the c.n.s. could not be found.[12] Neither could lesions in the c.n.s. or the large peripheral nerves be found in horses, cows, and sheep manifesting symptoms of toxicity and lesions in various other organs.[15]

Antidotes.—Urethane and, to some extent, dilantin appear to be effective in ameliorating the neurologic symptoms of DDT intoxication in laboratory animals. In some cases, however, a one- to three-day administration is necessary, due to the persistence of the symptoms after they have appeared.[23]

Calcium gluconate in 10 per cent solution has been reported to relieve the convulsions of acute DDT poisoning in dogs.[25]

PREPARATIONS

In general, DDT preparations are classified as solutions, emulsions, suspensions, and dusts.

Solutions.— Solutions are usually prepared in petroleum products such as kerosene in 5 per cent concentrations. Since the solvents in these preparations are volatile, they may be used as residual sprays on premises where the visible white residue from water suspensions of the drugs is not desired. Animals should not be sprayed with DDT solutions, and adequate protection is advisable against contamination of the feed and against the fire hazard in closed buildings. The use of the aërosol bomb (DDT organic solvent, Freon) cannot be recommended for use on animals until more extensive work is reported regarding chronic toxicity.

Emulsions.—Emulsions are prepared as a solution usually of 20 to 35 per cent DDT in an organic solvent, with an emulsifying agent added. The product is prepared for use by diluting with water to the desired final concentration of DDT. These preparations can likewise be used as residual sprays for premises and they have been used on animals in final DDT concentrations of 0.1 to 5.0 per cent. On the basis of gross observation, no apparent evidence of clinical toxicity has as yet been reported, but it would seem desirable that widespread use of the drug in this form be discouraged until more information is available, since DDT is in actual solution in the organic solvent used and increased skin absorption must be expected. The solvents are present usually to the extent of 6 to 7 per cent final concentration. The possible irritating effect of the solvent on the skin, and the possible fire hazard presented by its use in closed buildings, should be considered.

Aqueous Suspensions.—Aqueous suspensions are made up from wettable DDT powders containing the active principle and a

*Central nervous system.

dispersing agent. The wettable powders on the market usually range from 10 to 50 per cent DDT, and are suspended in water to be used on premises or as a dip or spray on animals. Final DDT concentrations of 0.1 to 2.5 per cent have given good results in ridding animals of ectoparasites and insect pests.

Dusts.—Dusts are marketed in from 3 to 10 per cent preparations with pyrophyllite or some other inert diluent. Good results have been obtained using dusts ranging in DDT concentration of from 0.25 to 5.0 per cent. The use of dusts on cats should be cautioned because of their licking habits and their marked susceptibility. Of the preparations available, the aqueous suspensions and the dusts, when properly used, constitute the safer products for animal use, considering the present state of information.

VETERINARY INSECTICIDAL USES

Stable Flies.—DDT has proved effective in the control of flies in barns, when used as a residual spray in 2 per cent concentrations.[2] Effective control of fly breeding in manure has been reported when the manure is thoroughly treated with DDT spray.[21] The drug is not very effective against maggots; however, the adults are killed by contact on emergence.

Buffalo Flies.—The buffalo fly has been controlled in many herds of cattle in Australia with the use of 4.0 per cent DDT spray. With pretreatment counts of from 200 to 2,000 flies, excellent control was found for two weeks, following a single herd application.[7]

Horn Flies.—One of the most extensive field trials of DDT was conducted in Kansas on 6,000 beef cattle on 30 farms.[14] Control of flies, lice, and mosquitoes was effected through the use of 0.1 per cent suspension as a dip, or 0.2 per cent suspension or emulsion as a pressure spray. Good control was obtained against horn flies when only 25 to 30 per cent of the herd was treated.

It was estimated that the treated animals gained 50 lb. over the controls during the grazing season. The treated herds did not "bunch up" on pasture as did the controls, but instead spread out over the pasture and grazed. Horn flies in Texas were effectively controlled with a 0.2 per cent pressure spray or a 2.5 per cent hand spray.[26]

Sheep Tick.—An aqueous dip of 0.1 to 1.0 per cent appeared to compare favorably with rotenone products in controlling the sheep tick.[3]

Fleas.—Ten gram of 4 to 5 per cent DDT dust has been found effective in eliminating, the dog flea, cat flea, and sticktight flea, with protection from reinfestation lasting four to seven days.[10]

Ticks.—A 5.0 per cent emulsion applied as a wash, or a 10 per cent dust, was used effectively in controlling brown dog tick and Lone Star tick infestations.[6] In the experiments reported, the only ticks left on the animals ten days after treatment were dead ticks. The latter would suggest that in determining the effectiveness of DDT against ticks, special attention should be used in determining the viability of the ticks remaining on the animals.

Rude and Smith report effective use of 5.0 per cent DDT paste against the Gulf Coast tick and the spinose ear tick, with protection afforded up to three weeks.[19]

A mixture of DDT and rotenone has been used to control cattle ticks in large scale experiments in Costa Rica. Over a three-year period, 110 experiments were conducted on cattle, with 95 per cent tick mortality in infestations as high as 40 per square inch.[29]

Lice.—A 0.5 per cent to 4.0 per cent dust has been found as effective as sodium fluoride against the chicken body louse and shaft louse.[24] Goat lice were controlled with 0.3 per cent DDT emulsion as a dip.[1] The blue louse has been found susceptible to 0.25 per cent spray in field trials on Kansas ranches.[14] All lice and nits on horses were killed within two days,[20] by 150 to 300 Gm. of "Neocidol."

Bed Bugs.—Administration of DDT to rabbits resulted in mortality to blood-sucking bed bugs on rabbits five hours later.[9] Five per cent DDT in kerosene as a residual spray on premises resulted in 100 per cent mortality of bed bugs up to the sixty-fourth day.[30]

Horse Flies and Mites.—At present, the indications are that DDT is not definitely effective against large horse flies or mites.

DISCUSSION

The activity of DDT against a variety of insect pests and ectoparasites of animals makes it a valuable addition to the list of

veterinary chemotherapeutic agents and its advantages should be fully utilized.

Like many active agents, however, improper use presents dangerous consequences. The drug is definitely a poison, a fact which must temper the wide acclaim, enthusiasm, and unrestricted use which at first usually accompanies such new agents.

Reports on controlled experiments in large domestic animals regarding chronic toxicity relative to its use in the field have not yet appeared in the literature, to our knowledge.

The fact that 1/20 of the single minimal lethal dose given daily is fatal to laboratory animals in about twenty days demonstrates the extremely cumulative action of the drug.

Recommendations for its use in food producing animals and milk cows should be of a very cautious nature until more information is obtained because of tissue accumulation (especially in adipose tissue) and of possible concentration in the cream and later the butter. It would seem desirable that the lowest effective concentration of nondissolved DDT preparations (dusts, up to 5 per cent for ectoparasites, and aqueous suspensions, 0.1 per cent dip or pressure spray, or 1.0 per cent hand spray), at longest possible effective intervals (a portion of the herd each time when used in fly control, one application per month) be employed until more complete information will justify specific recommendations to the farmer for the safe routine use of DDT on livestock. Great caution is especially indicated in its use on food-producing animals.

Again, it would be well to stress the fact that its action on insects can be characterized as "slow knockdown but sure kill"[5], indicating that its effect is not due to repellent properties but rather to reduction in insect population over an appreciable period of time.

SUMMARY

1) DDT was first discovered in 1874.

2) First described as an insecticide in 1941.

3) Recommended for use in U. S. Armed Forces in 1943.

4) White crystalline powder, insoluble in water, soluble in fat and fat solvents.

5) Contact and/or stomach poison for insects.

6) Absorbed through skin when in solution.

7) Appreciable absorption from intestinal tract to extent of 50-95 per cent in oil.

8) Distributed to all tissues examined and found in feces.

9) Concentrated in fat tissue and excreted in milk.

10) Slow excretion; urinary excretion as DDA mainly.

11) Extremely cumulative.

12) Poisonous to man and lower animals.

13) Toxic symptoms referrable mainly to the nervous system.

14) Lesions primarily in liver, some in c.n.s. and muscles, some hemorrhages, particularly in large domestic animals.

15) Urethane, dilantin, and calcium gluconate appear to have some antidotal effect.

16) Dusts and water suspension are effective and, of the various preparations, are safer for animal use.

17) Of veterinary interest, found to be effective in the control of stable flies, horn flies, house flies, buffalo flies and sheep ticks; mosquitoes, bedbugs; chicken lice, hog lice, dog lice, goat lice, and horse lice; dog fleas, cat fleas, and sticktight fleas; brown dog tick, Lone Star tick, Gulf Coast tick, spinose ear tick, and cattle ticks in Costa Rica.

18) Mites and large horse flies are apparently more resistant.

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Weed Killer

The use of 2,4-D in spraying pastures to kill weeds did not prove injurious to cows or sheep grazing these pastures, nor was any of the compound (2,4-dichlorophenoxyacetic acid) found in the milk produced by the cows.—*Agric. Res. Admin.*

Where applicable in the form of an ointment, colchicine is reported to give interesting results in the treatment of benign growths, *e.g.*, cutaneous papilloma. Its inhibitory action on mitosis justifies its use for that purpose. Colchicine has not been successful in the treatment of cutaneous epithelioma (cancer) but seems to have had some value in concert with radiotherapy.

Food, work, security, and freedom are gifts which science has put within the reach of all. The resources, the knowledge, and the ability to build a new world are there, but instead we have danger and bloodshed, want and misery.—*J. D. Bernall (London) in The Scientific Monthly.*

M. E. Jackson, extension poultryman at Kansas State College, warns that many flock owners who are concerned over reduced egg production will find their layers badly infected with lice. The common large louse is most important, and a practical control method consists in painting the roosts with 40 per cent nicotine sulfate solution.

The average egg size of a flock of pullets increases from the time they start laying until about February 1.

Although the term "folic acid" is derived from "leaves," the substance is also present in yeast, liver, and kidney.

Without disparaging the therapeutic and dietary use of synthetic vitamins, it is well to remember that some of the natural vitamins contain unknown factors which the synthetic ones do not possess.

SURGERY & OBSTETRICS

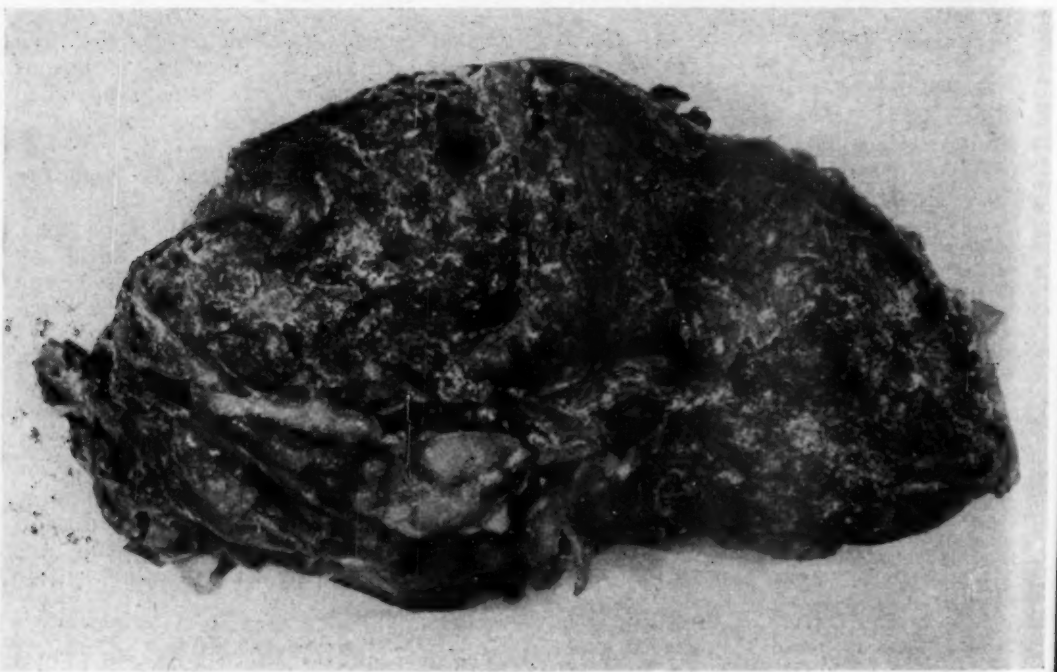
AND PROBLEMS OF BREEDING

Mummified Fetus

W. F. GUARD, D.V.M.
Columbus, Ohio

History.—Registered Jersey Heifer, 2 years old. Bred and conceived Dec. 22, 1944. Due to freshen September, 1945. The animal did not freshen and did not come in heat.

In December, 1945, Dr. A. G. Duber of Delaware, Ohio, examined the cow, diagnosed the presence of a mummified fetus, and administered 40 mg. of stilbestrol. In a day or so there was a slight mucopurulent discharge from the vulva but no other symptoms noted. Three weeks later he gave 40 mg. stilbestrol with the same results. On January 20, he administered 50 mg. stilbestrol, following which, on observation, there was no sign of dilation of the cervix or any more results than those following the other two treatments. Dr. Duber sent the cow to our clinic on February 7, for possible cesarean section. A vaginal discharge was still present but the cervix was not dilated. The vagina was flushed with warm saline solution and the cow kept under observation.



Mummified fetal mass.

Dr. Guard is chairman of the Department of Veterinary Surgery and Clinics, The Ohio State University, Columbus.

During this time, Dr. Flatla, of the Veterinary College of Oslo, Norway, was visiting here and reported that they had obtained excellent results with the use of 50,000 units of "foliclene" obtained from pregnant mares' urine; the following day 5 to 10 cc. of pitocin was given, part intravenously and part subcutaneously. We decided to give this method a trial.

2-year old Jersey heifer.

On February 13, 10:00 a.m., 50,000 units of estrotron (Pitman-Moore) were given subcutaneously. February 14, 9:30 a.m., 5 cc. pitocin (Parke-Davis) were given subcutaneously, followed by 3 cc. pitocin intravenously, at about 11:00 a.m. (According to Dr. Flatla they are both administered at the same time.)

On the morning of February 15, a vaginal speculum was inserted. The cervix appeared to be somewhat relaxed or open and mucous discharge was flowing from it. The following morning, February 16, the animal was in true labor, with the fetus partly in the vagina. A little manual assistance was given at this time and a mummified fetus, approximately 18 inches in length, was delivered. I believe the fetus would have been delivered without any assistance. No further treatment was used. The animal was discharged on February 21, in apparently normal condition.

An interesting comment by the owner at the time he took the animal home was to the effect that there was no sign of hernia present before the stilbestrol was administered. When the animal came to the clinic this hernia was plainly evident and the ring was large enough to admit an entire hand.

Temperamental Ewes

When a ewe loses a twin lamb, she lets the survivor have but one teat until she forgets the lost one. She thus leaves the unused half of the udder in need of attention.

• • •

Should a ewe disown one of her twins, as ewes sometimes do, it is generally better to bring up the unwanted one by hand rather than fuss with the temperamental motherhood of ewes.

• • •

It is futile, as a rule, to try to have a ewe adopt an orphan to suckle with her own lamb. If attempted, the age of the two must be about equal. Only exceptional ewes can be induced to adopt a lamb more than two weeks older than her own.

Induction of Lactation

A copious lactation may be induced in a proportion of maiden heifers and dry cows under farm conditions by the subcutaneous implantation of solid tablets of synthetic estrogen, according to Dr. D. N. Spriggs (*Vet. Rec., 47,* (1945): 519), but he cautions that it is also evident that the procedure can not be applied on a widespread scale.

When 50, 50-mg. tablets (2,500 mg.) were implanted for not more than sixty days, the best results were secured. Two 1-Gm. tablets were less satisfactory. Of 13 maiden heifers and 6 dry cows so treated, 10 produced an economic yield of milk, the heifers being better subjects than the cows. Four of the 13 heifers subsequently became pregnant, but normal estrum was not observed for some months following removal of the tablets. In the course of treatment some animals showed a changed pelvic morphology, some developed typical nymphomania, and some suffered pelvic fractures.

Diversity of results was not related to the age of the animal, the degree of mammary development present when treatment was started, nor to the dosage or duration of the implant. The only constant observation was that animals of good dairy quality were better subjects than common cattle.

Abortion in sows as a result of Brucella infection often occurs so early that it is not recognized.

A Method for the Aseptic Bleeding of Animals

WILLIAM E. MADERIOUS, B.S., D.V.M.
Berkeley, California

EXPERIMENTAL work now in progress at this station has necessitated the collection, under field conditions, of numerous aseptically drawn bovine blood samples. Methods previously thought to be satisfactory for this purpose were not considered desirable for the present work, inasmuch as they were not adapted to widespread use in the field. A simple, vacuum-bleeding apparatus was developed to meet the need for suitable equipment, and was found to be efficient.

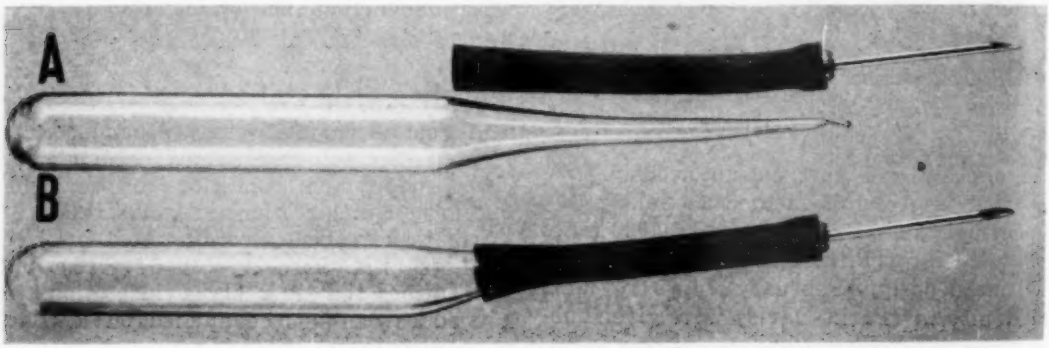


Fig. 1—(A) Sealed tube, needle, and tubing before assembly. (B) Completed apparatus.

A brief description of its preparation and use follows.

About 10 cc. of coagulated or uncoagulated blood may be collected. If the latter is preferred, sodium citrate, potassium oxalate, and heparin have all been proved to be satisfactory anticoagulants. The proper amount of a solution of the particular anticoagulant to be used is placed in a plugged soft glass, test tube and the tube sterilized either in the hot air oven or autoclave. Dry heat is preferred, since it also accomplishes the evaporation of the anticoagulant solution. However, autoclaved tubes may be dried by being placed in the bacteriologic incubator over night.

The tube is then thoroughly heated over a Bunsen flame, with its upper portion finally being subjected to a concentration of heat sufficient to soften the glass and allow its being drawn apart. The upper end of the larger portion of the glass tube is thus tapered to a capillary point. This is sealed by heat and the tube allowed to cool, whereupon a partial vacuum is created within it.

The tapered end of the vacuum tube is then inserted into a 3-inch length of 3/16 inch rubber tubing containing a 2-inch, 15-gauge, hypodermic needle in its opposite end. The assembled apparatus is then autoclaved in an ordinary pipette cannister.

In the field, the animal to be bled is restrained in the usual manner, and the skin over the jugular vein thoroughly painted with 1/100 per cent iodine in isopropyl alcohol. A sterile, vacuum tube is withdrawn from the cannister, the needle grasped by the hub and immediately thrust through the skin and into the jugular vein. It is then held in place until the capillary portion of the glass vacuum tube is broken by pinching the rubber tubing around it, whereupon the released negative pressure causes a flow of blood directly into the tube. The usual volume collected in this manner is about 10 cc.

The filled tubes may be prepared for transportation in various ways. Perhaps the simplest method consists in doubling the rubber tubing back on itself and holding it in place with a rubber band. If greater care is deemed advisable, the rubber tubing is bent double and the entire apparatus thrust into a plugged sterile tube 1 inch in diameter. If a flame is available, the broken capillary portion of the glass tube may be

From the Department of Veterinary Science, University of California.

sealed by heat. In the laboratory, the thin-walled, upper portion of the glass tube is nicked with a file and easily broken. The blood is then available for use.

A large number of cattle and several horses have been bled in this manner, and sterility controls have failed to reveal contamination in any case. The equipment and technique can be easily adapted to the aseptic bleeding of any species.

SUMMARY

A vacuum apparatus and a technique for the aseptic bleeding of animals is described. The apparatus may be prepared in the office or laboratory and was proved efficient in obtaining uncontaminated blood samples of approximately 10 cc. in volume.

Routine Use of Dicumarol

Wherever there is traumatic phlebitis, there is danger of pulmonary embolism, although it cannot be said (from veterinary literature) that the pneumonia developing in our surgical patients during the first two postoperative weeks has been stressed as such. Certainly, venous thrombosis is not that rare in animals subjected to surgical operations, in view of the pulmonary complications that do follow veterinary surgical work involving pyogenic infections. As this writer (L.A.M.) has casually pointed out on various occasions, inhaled anesthetics have been blamed for postoperative pneumonia where the gross pathology of the lungs, *post mortem*, appeared to incriminate embolism. Suspected embolic pneumonias, following extensive dissection such as the radical operations for fistulous withers or poll evil, amputation of a prolapsed uterus, and intra-abdominal hysterectomy, especially in debilitated subjects, were observed. The length of the veins stemming from the site appeared to be a predisposing factor. Human surgeons point to the saphenous vein as a common predisposing factor in pulmonary embolism, following amputations of the leg. It is logical to suppose that pulmonary embolism is of frequent occurence in animals but seldom fatal in itself, serving only as starting foci of extensive inflammatory processes in the lung substance.

The purpose here is to suggest the use of dicumarol, routinely, in grave operations as an added precaution and also, to suggest critical investigational work on the occurrence of postoperative pulmonary embolism in animals subjected to the type of intervention most capable of causing it.

Tetanus Anatoxin, the Life Saver

Among the American troops of World War II, operating over the deadly tetanogenic terrain of historic battlefields where tetanus killed countless thousands during the great wars of former centuries, the prevention of that wound infection was practically complete, according to a communication to the Academy of Veterinary Medicine[1] of France. In veterinary literature, it is permissible to point out that the remarkable achievement springs from the research of Ramon, Alfort alumnus, of the Pasteur Institute of Paris, who preconized and developed the use of specific bacterial toxoids for immunizing purposes and worked out the dosage required to build up maximum protection against tetanus, namely: *3 injections of toxoid at intervals of three weeks and a fourth injection a year hence*, which, says the report, was the schedule adopted for the American troops.

The communication recalls the chain of trials in horses which led to the dosage recommended. A single dose of tetanus toxoid produces little or no antitoxin in the recipient's blood but has the remarkable property of stepping up the aptitude to produce large quantities following subsequent injections, and there lies the secret of antitetanic immunization of man and animals. The report (*loc. cit.*) cites the amount of neutralizing power the blood of a horse has lost a year after receiving 2, 10-cc. doses. While 1 cc. of a horse's serum after the 2 initial doses neutralizes 400 lethal doses (for guinea pigs), at the end of a year the antitoxic power per cubic centimeter will have dropped to 60 lethal doses.

The phenomenon of toxoid antitetanic immunity is ascribed to a bond between the toxoid itself and the peculiar aptitude to form antitoxin, which it has the power to develop. The same attribute applies to diphtheria toxoid, except that in both horse and man, the aptitude to elaborate antitoxin may be created by occult natural immunization as well as by the aid of anatoxin.

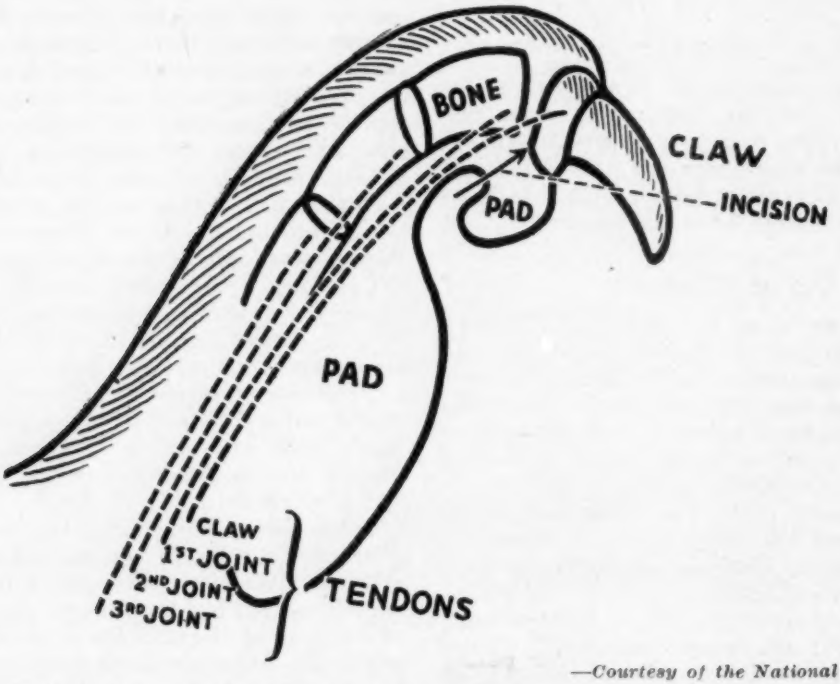
[1]G. Ramon and R. Richou: Sur l'aptitude à la production de l'anatoxine tétanique créée chez le cheval par la vaccination au moyen de l'anatoxine specifique: conséquences. Bull. Acad. Vêt. de France, *18*, (Oct. 1945): 232-239.

Digital Tenotomy in Foxes

Foxes are prevented from digging and climbing by means of a simple tenotomy, described by E. A. Hartmen, Salt Lake Fur Farm, in *National Fur News* for October, 1945. The author criticizes operations performed too far back on the toe, which entirely cripple the digit. He divides the tendon under the pad immediately behind the claw. *See* figure. It renders the claws useless and leaves the rest of the foot useful. Dividing the tendon at the level of the second joint or proximal thereto deprives the fox of "spring and balancing power" by throwing the entire weight on the heel or back of the pad.

The tendon is divided beneath the pad at the embedded extremity of the claw, where it can be felt plainly under the skin when strain is put on the toe. When the tendon is snipped, the claw can be folded over the dorsum of the toe but the toe itself suffers no harm.

In habitual fighters and climbers, the operation is done on all four feet. The technique is simple and a matter of but half a minute for each foot. The paw is taken in the left hand and the claw pressed up with the thumb (protected with tape) to stretch the tendon as the knife blade—a Bard-Parker, No. 3 handle and No. 12 blade—snips it. The dew claws are cut at the same time as these tear more fur than the other claws. If performed early in life, the operation prevents the habits for which it is employed. The technique is original and has been practiced at the Salt Lake Fur Farm annually since 1932.



—*Courtesy of the National Fur News*

Graph of Hartman's tenotomy performed on fur-farm foxes to prevent or stop the habit of digging and climbing without disabling the paw.

Anesthesia

When you have a dog tied down on the table for an operation, and for any reason more time is consumed than the original dose of anesthesia permits, the sublingual vein presents the handiest portal for administration of more nembutal through a 25-gauge needle, according to Dr. Robert Nichols, of Fryeburg, Maine.

CLINICAL DATA

The Treatment of Enteritis with Sulfathalidine

NORMAN L. GARLICK, D.V.M.
Tacoma, Washington

SULFATHALIDINE (phthalylsulfathiazole) is one of the most recently synthesized sulfonamide compounds and has been studied extensively in the treatment of gastrointestinal infections by members of the medical professions. The preparation of this compound was reported in July, 1942, by Moore and Miller.[1]

Poth and Ross[2] reported: "This compound, like succinylsulfathiazole, is sparingly absorbed from the gastrointestinal tract, maintains low concentrations in the blood, and is rapidly excreted in the urine. . . . Microörganisms in the stools are usually greatly decreased in twenty-four hours by phthalylsulfathiazole, and coliforms are ordinarily reduced to less than 1,000 per gram of wet feces within three days."

Mattis and his coworkers[3] conducted comprehensive pharmacologic and toxicologic studies with this compound in monkeys, rats, and mice. Their results indicated that it was relatively nontoxic when administered orally.

Thorp and his associates[4] have reported on the use of sulfathalidine in the treatment of gastrointestinal infections in calves. Graham and his associates[5] conducted clinical studies showing it to be effective in the treatment of enteritis in swine. These investigators observed no evidence of toxic effects when the drug was administered in therapeutic amounts.

Almost two years ago we started clinical experiments with this drug.* At that time, we were interested in finding a nontoxic, nonabsorbable drug for the treatment of intestinal infections which occur in the various animals that come under our care. The dosage forms employed were 7.7 gr. (0.5 Gm.) tablets and 61.7 gr. (4 Gm.) bolets. The drug is insoluble in water, but forms a well-dispersed suspension which precipitates rapidly.

Specific indications for the drug have been found in the following diseases:

Calf Scours.—Severe outbreaks of white scours in dairy calves were controlled without loss when treatment was started early, and particularly when sulfathalidine was combined with kaolin and bismuth. Vitamin A was not included in the treatment.

The average dosage which was found to be effective for a Holstein-Friesian calf was an initial dose of 123.4 gr. (8 Gm., or 2 bolets), followed with 61.7 gr. (4 Gm.) twice daily with a diluted milk ration. Treatment was continued for three days, or until symptoms were no longer in evidence. No toxic effect was noted.

Gastroenteritis in Cats.—When treatment was started before the temperature dropped below normal, and particularly before vomiting began, the results were favorable. Whereas, our mortality, when mixed infection serum and mineral oil were used, was about 90 per cent, we now expect only 30 per cent. The dosage found to be effective for average sized cats was 3.5 gr. (0.25 Gm.) three times daily. As much as twice that amont has been given with no toxic effects.

Pig Scours and Infectious Necrotic Enteritis.—Good results were obtained in these conditions when 0.5 to 1.0 gr. per pound of body weight per day was used in 1 dose, or divided doses, and administered in the feed. No toxic effects were discernible.

Garbage Poisoning, or Noncontagious Gastroenteritis of Tainted Food Origin in Dogs.—Since we are located in a city, we treat many of these cases. When enteritis was present without symptoms of vomiting, sulfathalidine tablets were given by mouth

*Courteously supplied by Sharp & Dohme, Inc., Philadelphia, Pa.

on the basis of 1 gr. per pound of body weight per day, in divided doses. When vomiting had occurred, an intestinal lavage of 61.7 gr. (4 Gm.) suspended in warm water, often stopped the vomiting and was an effective method of medicating the bowel when medication *per os* could not be given. No toxic reaction was noted even when twice this dosage was given, experimentally.

TABLE I

Species	Diagnosis	No. of Animals	Dose of Sulfathalidine	Duration of Therapy	Recovered	Died
Calves	White diarrhea	47	1 gr. per lb. body wt. per day.	3 to 5 days	47	(2 subsequently died of pneumonia)
Cats	Gastro-enteritis, infectious.	72	1 to 3 gr. per lb. body wt. per day.	2 to 5 days	54	18
Hogs	Necrotic enteritis	17	½ gr. per lb. body wt. per day.	4 to 6 days	14	3
Dogs	Distemper, enteric form	14	1 to 2 gr. per lb. body wt. per day.	2 to 10 days	Slight improvement 6, no response 8	
Dogs	"Garbage poisoning"	41	1 gr. per lb. body wt. *per os*, or 2 gr. per lb. body wt. as an intestinal lavage.	1 to 7 days	39	2

Some of the data upon which the above conclusions are based are given in table 1.

In leptospirosis and in salmon poisoning, the drug proved to be useful in controlling secondary infections, but more work is needed before definite conclusions can be drawn.

We attempted to use sulfathalidine for the therapy of enteritis associated with distemper, but had very little success, due to the fact that the erosion of the mucous membranes, rather than the presence of bacteria, perpetuated the diarrhea.

In conclusion, we can say that sulfathalidine (phthalylsulfathiazole) has its place among useful drugs, and can be used to advantage in stubborn cases of bacterial enteritis. At the present writing, it appears to be the most effective therapeutic agent available for the treatment of the conditions mentioned in this communication.

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Maintenance of Body Temperature

Warmblooded animals maintain body temperatures within a narrow range by a complex series of mechanisms which balance heat production with heat loss. Heat loss occurs through conduction, radiation, latent heat of evaporation from skin and lungs, the warming of ingested food and drink and inspired air. Energy is also needed to perform work, produce growth, and form secretions.—*Nutr. Reviews, February, 1945.*

The Incidence of Rabies

A report for 1945 by the USDA gives the number of rabies cases in the United States as 10,540, nearly half of which occurred in six states: Louisiana, 996; Texas, 950; California, 914; Pennsylvania, 904; Georgia, 619; Tennessee, 505. With the exception of 2 cases reported in Minnesota, the whole Northwest as far as the Pacific Coast was rabies-free. Most of the cases were in dogs, but there were 53 human cases, 561 in cattle and 419 in cats, plus an unstated number in other farm animals and wildlife.

Spirochetosis in Turkeys
(A Preliminary Report)

H. A. HOFFMAN, D.V.M., T. W. JACKSON, D.V.M., and J. C. RUCKER

Sacramento, California

SPIROCHETE infection occurred and is being studied in a flock of adult turkeys. This report includes a record of observations on the flock and of the results of autopsies on field cases. The results of a more detailed study of laboratory findings will be published at a later date. Becker[5] reported experimental infection of turkeys with spirochetes, but a search of available literature gave no evidence of previous natural infection in this species. Neither is there evidence of its occurrence in any other species of domestic fowl in the United States.

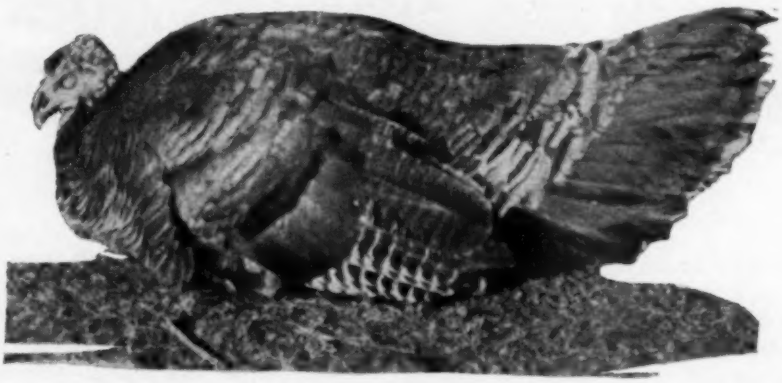

Fig. 1—Turkey hen affected with spirochetosis. Note squatting position and closed eyes.

This flock consisted of 600 hens and 72 toms. The sexes were penned separately on the same farm at a distance of approximately 40 yards from each other. Prior to the last visit to the farm, Dec. 13, 1945, the disease had been limited to the hens. At the time of the last visit, 2 toms appeared droopy. Examinations of these 2 birds were not made.

The farm consists of 40 acres which lies in a series of gentle knolls. The soil is sandy with several large granite rocks protruding in widely separated locations. A small grove of oak trees is located in a field adjacent to the one occupied by the hens.

The buildings consist of a dwelling, hay barn, feed house, and numerous small structures, including three chicken houses. One of the latter buildings was comparatively new and modern, while two of them were of older construction. The entire farm is neat and well kept. The contour of the land and the character of the soil are such that excellent drainage is provided. None of the fields occupied by the turkeys becomes muddy, even after hard rains.

These birds were raised on a farm in the same vicinity, but at some distance from the present owner. They were moved to the present location approximately seven weeks prior to the identification of the first spirochete infection. The owner reported that the remainder of the birds in the flock from which these were purchased, has been entirely healthy. The birds were transported to the farm in poultry crates that had been borrowed from two neighboring farmers.

Birds from this flock have been examined on five separate dates. On November 6, 1945, 2 birds were examined. Bird 1 was affected with infectious enterohepatitis and bird 2 showed evidence of a severe inflammation of the intestines. Cultures from bird 2 were negative. Blood smears were not made. A rabbit injected with an extract

From the Division of Animal Industry, California State Department of Agriculture, Sacramento.

of liver tissue from bird 2 remained healthy. At this time, the owner reported 2 sick birds, but the flock was eating well.

On November 26, 1 additional bird was examined. The rectal temperature was 110 F. and the respiration labored. The autopsy revealed severe enteritis. The liver was slightly swollen and congested and the spleen enlarged and granular in appearance, with hemorrhagic areas on the surface. The heart and lungs were congested. Petechiae and ecchymoses appeared on the surfaces of both organs. Blood smears contained bipolar bacteria and spirochetes. A rabbit injected intramuscularly with an extract from the spleen died within twenty-four hours. An adult White Leghorn hen injected intramuscularly with spleen extract failed to exhibit symptoms within ten days. Cultures from the field case and from the rabbit contained *Pasteurella avicida*.

On November 28, a visit was made to the farm. Sixty-four birds had been removed from the flock over a period of approximately three weeks. These birds were quite sick. Many sat on the ground with necks retracted and eyes closed. The owner reported marked loss of weight in many birds. There were a number of sick ones in the main flock of hens, but the flock of toms appeared to be normal.

While at the farm, November 28, 1 turkey hen that had died a short time previously was obtained for examination. Smears from the heart blood were negative for bipolar bacteria and for spirochetes. A total of eight agar slants made from the heart blood, liver, and spleen were entirely negative, except for a spreading growth on one slant.

At the time of this visit, blood samples were drawn from 3 sick birds in the main flock. These samples were cultured on agar with negative results. Smears from these samples were stained and examined microscopically. Blood sample number 1 was negative for either bipolar bacteria or spirochetes, while samples 2 and 3 each contained spirochetes. Each of these samples was injected into 2, 3-week-old chicks. The chicks injected with sample 1 remained normal. Those injected with samples 2 and 3, respectively, developed spirochetosis. One of the chicks receiving sample 3 died after seven days and the others were destroyed for autopsy at approximately the same time.

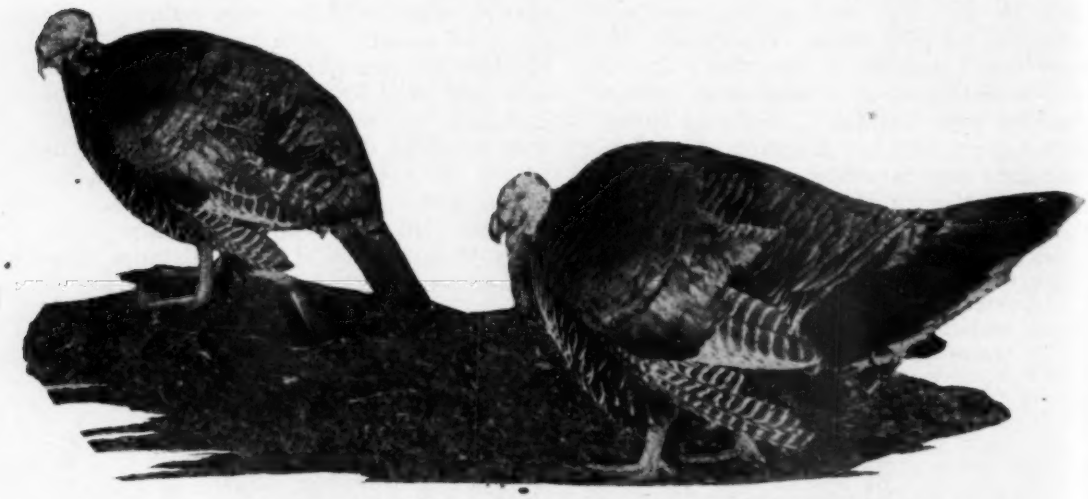

Fig. 2—Turkey hens showing earlier symptoms of spirochetosis.

On November 29, another sick bird was brought in for autopsy. This bird had a rectal temperature of 110 F., and died while awaiting examination. Blood drawn from a wing vein was injected into a White Leghorn hen and 4, 10-day-old chicken embryos. The results of all of these inoculations were negative. Cultures made from the turkey hen (field specimen) were negative.

On December 3, the flock was again visited and blood samples were drawn from 5 sick birds. The rectal temperatures of

these birds were 109.4, 108.2, 105.8, 108.4, and 109.2 F., respectively. The samples were stained and examined. Neither bipolar bacteria nor spirochetes were found.

On December 5, the flock was visited again for the purpose of trying remedial measures. Twenty-seven birds had been segregated from the main flock and confined in an isolated unit. They did not include any of the 64 birds originally segregated. Six of these birds were injected intravenously with neoarsphenamine in doses of 0.07 Gm. Five birds were injected intraperitoneally and 2 subcutaneously with penicillin in oil, in doses of 10,000 units, and 3 intraperitoneally with 15,000 units. Eleven sick birds in the same pen were held as controls. All of these birds were definitely sick. Rectal temperatures taken at the time of treatment ranged from 105.0 to 109.4 F. When the birds were observed on December 5, none showed material improvement, while on December 13 most of them, including the controls, appeared to be well on the way to recovery. There was no evidence that the treatments used had materially altered the course of the disease. A survey of the main flock indicated approximately 24 new cases.

OBSERVATIONS

The presence of infectious enterohepatitis in 1 of the birds examined November 6 and the fowl-cholera infection in the bird examined November 26 renders an interpretation of the clinical picture difficult. The owner was questioned repeatedly concerning death losses and in so far as could be determined, this had not exceeded half a dozen birds since November 6. Inasmuch as both infectious enterohepatitis and fowl cholera are likely to be highly fatal, and because each of these diseases was found in only 1 bird, it seemed reasonable to assume they were not major factors in causing the symptoms in 115 or more birds.

Symptoms.—Sick birds appeared sleepy. Many stood or sat with eyes closed, and were obviously asleep. When startled, all moved off in a reasonably alert manner and continued alert for a short time. They would then settle back to the original position and fall asleep. Affected birds ate sparingly and lost weight. Many had diarrhea. Some of the more severely affected, walked with difficulty and exhibited symptoms of arthritis. They had a squatting gait, walking with the body close to the ground. Most of these made partial recovery and walked normally.

Lesions.—The lesions in affected birds were not striking. The liver and spleen were slightly enlarged. This was a contrast to the observations of Sreenivasan and Sankaranarayan[1] in India, in which they reported affected fowl with spleens six times normal size. Hutyra, Marek, and Manninger[2] describe enlargement and necrosis of the spleen in chickens and necrosis of the liver in a goose.

Mortality.—The relatively mild nature of the infection and the low mortality is in contrast with spirochetosis in chickens and other birds as reported by Sreenivasan and Sankaranarayan,[2] Hutyra, Marek, and Manninger[2] and Reis, Nobrega, and Reis.[3]

Method of Spread.—A careful search was made for poultry ticks in all poultry houses. There was no evidence of these parasites. Two species of poultry ticks are recorded from California. *Argas persicus* has become well established in the Sacramento Valley. The fowl tick, *Argas reflexus*, an Old World species, commonly called the pigeon tick because of its preference for pigeons, has been found in southern California, ranging as far north as Contra Costa County. Morcos[4] quotes Montgomery to the effect that *Ornithodoros moubata* readily transmits *Spirochaeta gallinarum*. This species is not found in North America; however, other species of the genus *Ornithodoros*, notably *Ornithodoros parkeri* and *Ornithodoros turicata*,[5] known to attack birds, are recorded from California. Reis *et al.*[3] quoted Fantham as reporting spirochetosis in grouse as being transmitted by *Ixodes ricinus*. This cosmopolitan tick is common in California.

SUMMARY

Spirochetosis was diagnosed in a flock of turkey hens. The infection was complicated by fowl cholera in 1 bird. The spirochete infection was mild, causing but few death losses. The duration of active infection in individual birds was not determined. However, the course of the disease together with convalescence approximated ten to twenty-one days, or longer. Careful search failed to reveal the presence of the several varieties of ticks known to transmit spirochetosis in other species of birds. A report of

detailed laboratory studies will be published at a later date.

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Note on Salmonella in Poultry Products

Salmonellosis of poultry has been identified with a variety of species of Salmonella other than *Salmonella pullorum*.[1, 2, 3] Of 47 species of Salmonella isolated from fowls, 41 have also been found in man.[3] Recently *Salmonella montevideo* was isolated from shell eggs which were incriminated in an outbreak of food poisoning in man.[4] The intensified production of powdered eggs during the past four years stimulated investigations on the occurrence of Salmonella in poultry products in view of the potential health hazard of these organisms to consumers. Techniques have been adapted which are capable of isolating Salmonella organisms when they occur in powdered eggs in number fewer than one organism per gram.[5, 6] Since chickens are implicated as the possible source of these organisms, the species isolated may be of interest to veterinarians.

During the microbiologic examination of the 1945 "backlog,"* February, 1945, to July, 1945, 199 samples of egg pulp were examined for the presence of Salmonella organisms. An incidence of 30.7 per cent was found. Of 61 isolations, 60 cultures were of *S. pullorum* and one of *Salmonella oranienburg*. Of 63 samples of powdered whole egg with a moisture content of 5 per cent, Salmonella were isolated from six samples, or an incidence of 9.5 per cent. The species observed were: *Salmonella typhi-murium, Salmonella montevideo, Salmonella paratyphi B, Salmonella cerro,* and two cultures of *S. oranienburg*. The method of isolation and identification was previously described.[6] *S. typhi-murium* was isolated from egg powder processed in a drying plant in Missouri. The other species were found in egg powder produced in Oklahoma. The following species have been isolated from powdered whole egg:[5, 6, 7, 8, 9]

Salmonella paratyphi B
Salmonella typhi-murium
Salmonella thompson
Salmonella oranienburg
Salmonella potsdam
Salmonello bareilly
Salmonella montevideo
Salmonella manhattan
Salmonella tennessee
Salmonella newport
Salmonella pullorum
Salmonella give
Salmonella senftenberg
Salmonella cerro
Salmonella minnesota

S. oranienburg, S. tennessee, and *S. pullorum* have been recovered from frozen whole eggs.[7, 10] *S. pullorum, Salmonella derby,* and *Salmonella cholerasuis* (var Kunzendorf) have been isolated from shell eggs.[4]

SUMMARY

Species of Salmonella have been isolated from poultry products implying that fowls may be a source of these organisms. Two species, *S. cerro* and *S. paratyphi B*, are added to the list recovered from powdered whole egg.—*Captain Morris D. Schneider, V. C.*

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*Frozen whole egg for army drying.

From The Seventh Service Command Medical Laboratory, Ft. Omaha, Neb.

The author is indebted to Captain Oliver H. Peterson, SnC, and T/Sgt. Berley A. Firmin, of this laboratory, who typed the cultures.

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Some Highlights from State Meetings

The 21st Annual Conference for Veterinarians at Alabama Polytechnic Institute, Feb. 26-28, 1946

To hold a hoof dressing in place on the sole of the foot drill three or four holes the size of a tenpenny nail through the wall of the hoof, emerging at the white line. Thread a wire through these holes, apply the dressing, cover with a piece of tin or sheet metal, and pull up the loose ends of the wire. This will hold the dressing in place until it needs to be examined or renewed, when the wire can be untwisted, the pack examined or replaced: the plate then can again be wired in position.—*Dr. J. C. Carey.*

An old drug for a new use may be classified as a new drug under the present Pure Food and Drug Act.—*Dr. H. E. Moskey.*

Swine erysipelas occurs in four types: septicemic, arthritic, cutaneous, and cardiac. The first type may be present without being recognized by the owner.—*Dr. H. C. H. Kernkamp.*

Alabama has 14 veterinarians spending full time, and 25 additional ones working part time, on inspection work.—*M. Clark, M. D.*

DDT will lose some of its popularity when derris root comes back on the market, but will continue to be used for certain purposes.—*Prof. F. E. Guyton.*

In dog practice, it is important to be on guard against the injudicious use of vermifuge.—*Dr. S. W. Haigler.*

Half of the livers condemned by meat inspectors, with an average value of $2.65 per liver, are discarded because they contain abscesses resulting from traumatic gastritis.—*Mr. H. R. Smith.*

In connection with any vaccination program, we must remember that it alone will not solve a disease problem, if we can judge by hog cholera which is still the greatest factor in swine losses, even though for many years we have had an almost perfect vaccination program available.—*Dr. H. W. Johnson.*

Brucellosis is the cause of more loss to dairy farmers in Alabama than any other disease, but this is due to a lack of application of the information available, rather than to lack of proper information.—*Dr. B. N. Lauderdale.*

• • •

Spring Meeting, Northern Illinois Veterinary Medical Association, March 27, 1946

The use of hormones in clinical medicine often fails because we do not know what is the proper dose, what constitutes balance, the timing of the estrual cycle, the content of the product being used, or the concentration of the active principle recognized.—*Dr. C. F. Cairy.*

Castrating, or even ringing, of pigs should be discouraged when they are being vaccinated with serum and virus.—*Dr. J. B. Baber.*

Sneezing and nasal trouble in little pigs is much less common after the brucellosis reactors have been removed.—*Dr. W. D. Daugherty.*

Cowpox is immunologically different from human vaccinia, although vaccinia can readily be transferred to heifers. Some outbreaks may be of mycotic or mycologic origin.—*Dr. H. J. Hardenbrook.*

To anesthetize a boar, snub him forward and back, wrap a turkish towel around his snout, pour on 1 oz. of chloroform, and wrap with a burlap sack. And soon as he goes down, remove the sack and the towel, and you will have time to complete a castration before he recovers.—*Dr. H. R. Hornbaker.*

Lymphocytoma (Leucemia) in a Cow

Report of Case

D. E. JASPER, D.V.M., J. H. SAUTTER, D.V.M., and W. A. MALMQUIST, D.V.M.
St. Paul, Minnesota

THE CURRENT interest in the clinical manifestations of bovine lymphoblastomatosis and the apparent increase in incidence during the past few years justify the publication of a case report describing this condition. This patient was a 6-year-old Guernsey received at the University Farm March 5, 1945, through the courtesy of Dr. H. Alme, of Amery, Wisconsin.

Fig. 1—Appearance of patient upon arrival at University Farm.

Anamnesis.—The animal passed through two normal lactations and calved normally for the third time Sept. 14, 1943. Milk production was bountiful, but there occurred a decided loss of weight in spite of a good appetite. On July 10, 1944, she was dried up and turned to pasture where she rapidly gained weight. She calved for the fourth time on Oct. 14, 1944, giving birth to healthy twin calves. The initial milk flow was heavy.

Approximately one month later, bilateral swellings were noticed in the region of the flank. In December, swellings which grew rapidly were noted in the region of the head. Loss of weight began shortly after parturition and was more rapid and severe than during the previous year, although her appetite remained good and she was fed a little heavier than usual.

Status Praesens.—An unusually symmetrical enlargement of the main external lymph nodes was at once apparent upon examination. These included the following lymph nodes: parotid, mandibular, atlantal, prescapular (posterior superficial cervical), prefemoral, and supramammary. Rectal palpation revealed a large number of enlarged glands in the pelvic and iliac regions. The examining arm was limited to a narrow winding passageway between the tumor masses.

Shallow and fast respirations suggested pulmonary and cardiac involvement. The animal was emaciated and seemed to have some difficulty in eating. She would stand before the manger and nibble daintily at her hay and grain for hours.

A tentative diagnosis of lymphoblastomatosis was made, and it was decided to keep the patient for further study.

Observations.—Blood examinations were made at intervals during the period of observation. By referring to table 1, it

*Paper No. 2266, Scientific Journal Series, Minnesota Agricultural Experiment Station.
The authors are on the staff of the Division of Veterinary Medicine, Agricultural Experiment Station, University of Minnesota, St. Paul.

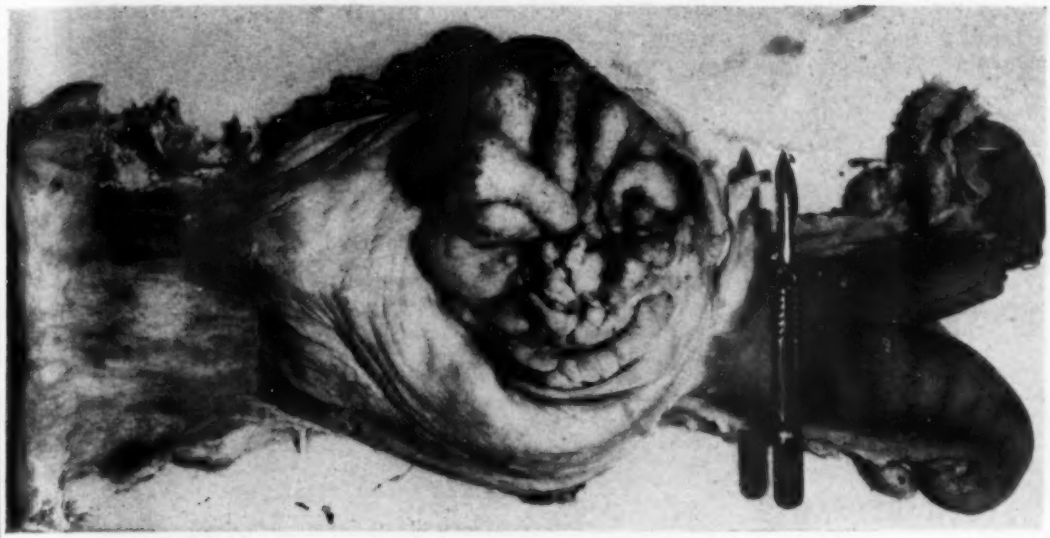


Fig. 2—Lymphoblastoma of the cervix.

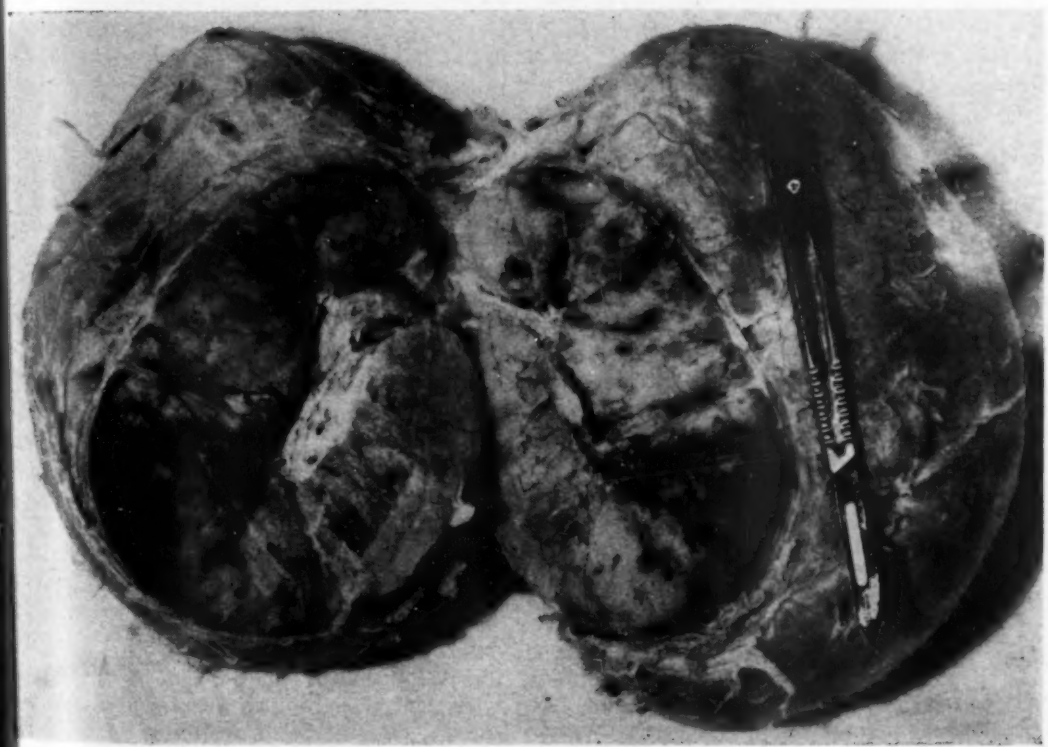


Fig. 3—Lymphoblastoma of supramammary lymph nodes. Note hemorrhagic areas in the stroma where the two nodes were separated.

can be seen that the blood picture was only slightly abnormal. The lymphocyte percentage was persistently about 10 to 20 per cent above the normal. The presence of nucleoli and a fine chromatin pattern were evidence of immaturity in a few of the cells. A number of the cells classified as lymphocytes may have been monocytes, but the differentiation was so uncertain that they were included with the lymphocytes. Many of these mononuclear cells were atypical. A slowly progressive anemia accompanied the disease.

TABLE 1—Blood Studies

Date	Hb.	R.B.C.	W.B.C.	Lympho. %	PMNs %	Eosin. %	Bas. %	Remarks
3-8-45		5,110,000	10,350	83	13	1.5	2.5	
3-12-45	7.1	5,070,000	11,150	77	21	1	1	Left prescapular node removed.
3-16-45	8.2	4,400,000	9,400	74	17	6	3	Several eosinophiles were banded rather than segmented.
3-27-45	8.3	4,510,000	8,450	81	14	5	0	Surgical wound completely healed.
4-6-45	8.0	5,190,000	7,600	71	26	1	2	Very few immature lymphocytes.
4-11-45	6.6	3,890,000	9,650	71	26	2	1	Increase in immature lymphocytes.
4-26-45	7.4	4,450,000	9,100	84	13	3	0	Auer bodies in several lymphocytes.
5-15-45	7.7	3,860,000	10,850	73	19	6	2	Increased evidence of immaturity.

The general condition of the animal changed very slowly. She ate sparingly, but did not seem to suffer, and gradually became more emaciated while the tumor masses slowly enlarged. The popliteal nodes which were not visible in March became visible in April. Periods of respiratory distress developed as the disease progressed. Gasping for breath through her open, frothing mouth was characteristic of these periods. At other times, the respiration was free and easy, although shallow and accelerated.

The temperature remained within normal limits for the most part. At one time, it was recorded at 103.4 F., following a period of respiratory distress.

Experimental Procedures.—Though transmission of the disease from animal to animal has been tried many times without success, it was deemed worthwhile to try some simple procedures in an effort to transmit the tumors to areas in the same animal not already involved.

March 10, 1945.—Two hundred and fifty cc. of blood were withdrawn, citrated, and centrifuged. The buffy coat was pipetted off and injected subcutaneously on the right side of the cow over the last intercostal space. The left prescapular lymph node was excised, and a portion of it was ground in sterile physiologic saline solution. A suspension of these cells was then injected subcutaneously on the left side. No evidence of any activity at sites of injection was seen.

TABLE 2—Size and Weight of Certain Lymph Nodes

Gland	Size (Cm.)	Weight (lb.)
Atlantal	10x9x6.5	0.8
Parotid	12x7.5x4	0.7
Mandibular	10x7.5x6.5	0.7
Prescapular	18x9x5	1.3
Post mediastinal	23x5x4	0.7
Prefemoral	20x11x7	2.6
Popliteal	11x9x6.5	1.0
Supra mammary	Rt. 22x12x6.5) Lft. 20x12x6.5)	5.5
Largest pelvic node	19x22x13	5.1
Total pelvic group		17.6

April 10, 1945.—The left prefemoral node was removed. A small piece of the lymph node was placed subcutaneously on the left side of the neck and a similar section was placed intramuscularly on the right side. Both transplants failed to grow for the

suppurated and could be squeezed out as a sanguineous, gelatinous mass about two weeks after their insertion.

Though lymphoblastomas of cattle are believed to be lymphatic and not myeloid in origin, tests of the urine for Bence-Jones protein were made on two occasions. Both tests were negative. Albumin was found to be present.

Fig. 4—Large group of tumors in the region of the pelvis.

NECROPSY

The patient was destroyed June 7, 1945. The emaciation and the involvement of peripheral nodes are described above. The gross lesions were:

Thoracic Cavity.—A group of nodes clustered around the thoracic inlet varied in size up to that of a baseball. The bronchial nodes and those along the dorsal vertebrae were enlarged. A large node was interposed between the base of the heart and the trachea, causing the adjacent part of the trachea to be flattened laterally. The tracheal rings pressing against the node were separated half an inch. Dorsal portions of the diaphragm were infiltrated, the pillars were about 1 1/2 inches thick.

Heart.—Both auricles were severely involved, being thickened and corrugated. Scattered areas of infiltration were visible throughout the ventricular musculature involving also the chordae tendineae and musculi papillares. The right auricle showed more lesions than the left.

Abdominal Cavity.—The mesenteric and gastric nodes were somewhat enlarged. The scanty contents of the small intestine were watery and mixed with mucus. The spleen was enlarged by about one-third.

Uterus and Ovaries.—Apparently normal.

Cervix.—The cervix was markedly infiltrated and greatly enlarged as shown in figure 2. Some of the folds and cross sections showed ecchymotic hemorrhages and inflamed areas. To the knowledge of the authors, such marked involvement of the cervix without involvement of other parts of the genitalia has not heretofore been reported to occur in this disease.

MICROSCOPIC PATHOLOGY

Heart.—Extensive infiltration in many areas. Even in areas grossly normal foci of infiltration could be seen upon microscopic examination. Invasion seemed to proceed first between bundles and then between

fibers. The auricles were so badly infiltrated that their identification as cardiac tissue was difficult.

Liver.—Moderate infiltration in portal spaces and around the central vein. Mild infiltration was scattered generally between the hepatic cords.

Kidney.—Many small areas of mild infiltration, often beginning in the glomerulus. A few larger areas of marked infiltration were found.

Cervix.—There was a massive infiltration of lymphoid cells making up the cervical tumor. The normal musculature was obliterated in many areas and hardly recognizable in others.

The Feed Situation

In a statement to all dealers handling feeds produced by the Ralston Purina Co., of St. Louis, Mr. Donald Danforth, president of the company, offers the following advice: Work closely with your feeders so that each bag will be used on the most efficient basis possible by (1) feeding only the efficient animals, (2) eliminating from flocks and herds the inefficient units, (3) maintaining only the number of animal units the feeder is equipped to care for, and (4) patronizing only the regular channels of marketing and distribution.

The Common Oil Can

Because homely and common, the ordinary oil can is rejected as a therapeutic gadget, despite the fact that it is the handiest and most reliable instrument conceivable for applying medicine over and into the body, for certain purposes. It's a one-hand instrument. For distributing a liquid over an area while the other hand rubs it in, for dressing or redressing wounds, or for *per os* and *per rectum* use, under certain conditions, the common oil can can't be laughed off for any reason except for what it is. A New Jersey dog breeder finds the oil can the best means of adding cod liver oil to the dish of dog food. It is easier to get the idea than the habit, until some instrument manufacturer provides an esthetic squirt can that looks fearfully and wonderfully made, and costs $1.50 instead of 15 cents.

Dairy Barn Flies

Three pounds of DDT to each 100 gallons of water sprayed with force (375-lb. pressure) onto walls and ceilings until the liquid runs off will kill flies in a dairy barn for two months. Penetration of the spray is important, especially where there are cobwebs and trash. One spraying in May and another around the first of August suffice for the latitude of the Central States. Milk must be protected against dead flies dropping from the ceiling.

The 50-gallon orchard sprayer is preferable but the small garden sprayer may be used.

Livestock of the U.S.A.

The production goals suggested by the USDA for 1946, in round numbers, give a clear insight to the meat-animal population of the United States as of the postwar period:

Dairy cows	25,507,000
Beef cattle	39,200,000
Spring pigs	52,000,000
Sheep	44,800,000
Chickens	680,000,000
Turkeys	39,700,000
Total	871,207,000

The figures for brood sows was increased from 8,187,000 to 8,360,000 in order to meet the increase of "pigs saved" by 570,000 head over 1945. But for this exception, slightly fewer meat animals will go on the market this year.

The intradermal skin test is the most reliable means of confirming a clinical diagnosis of chronic brucellosis, one of the most prevalent of modern diseases, in the opinion of H. M. Benning, M. D. (*J. A. M. A.*, Feb. 9, 1946). He tabulates more than 1,000 persons tested, of whom 13.2 per cent showed a positive reaction to Brucella nucleoprotein. Of 78 treated cases that could be adequately observed, 70 improved while 8 did not. The skin test should be repeated every six months to detect a relapse.

Mineral deficiencies may be important if roughage is grown on depleted soil.

NUTRITION

Vitamin K

Vitamin K may be an important practical problem in the feeding of poultry, but not in other farm animals. In the absence of adequate amounts of this vitamin, the clotting time of the blood is prolonged, thus leading to extensive hemorrhage from

—*The Upjohn Laboratories*

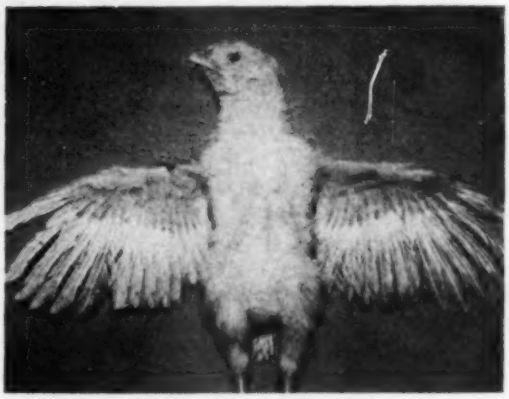
Fig. 1—Chick fed a vitamin-K deficient diet for first fifteen days developed spontaneous subcutaneous hemorrhages which may be seen in the wing and in the region of the crop.

otherwise minor injuries or, in some instances, apparently spontaneously.

Along with vitamins A, D, and E, this is a fat soluble vitamin. It occurs in two forms in nature, K_1 being found in green leaves of plants with alfalfa leading the list, and K_2 occurring in fish meal. The vitamin also may be synthesized in the intestine by certain types of bacteria, and synthesis is favored by the conditions which exist in the rumen.

Absorption occurs in the upper portion of the jejunum, and the presence of bile in the intestine is necessary for this absorption. When bile is excluded from the intestine experimentally there is a failure of absorption. A less complete exclusion of bile occurs with obstructive jaundice, constipation, or extensive liver damage.

The action of vitamin K in the body consists of two steps. The vitamin is absorbed at the level of the upper jejunum and carried to the liver, where it is changed to prothrombin. Limited amounts may be stored in the liver, but there is no storage elsewhere in the body. From the liver, the prothrombin is liberated into the blood stream where it comes in contact with thromboplastin and calcium to form thrombin. Whenever the need for fibrin is presented the platelets liberate fibrinogen, which is converted to fibrin on contact with



—*The Upjohn Laboratories*

Fig. 2—Chick, same age as the vitamin-K deficient chick (Fig. 1), but fed an adequate diet.

the thrombin. This is a complicated mechanism for a comparatively minor function, but illustrates the safeguards which nature has developed to guard against possible interference with normal body function.

From the preceding discussion, the relationship of vitamin K to sweet clover disease is naturally brought to mind. The answer is that vitamin K is not involved in the hemorrhage which accompanies sweet clover poisoning. In this condition, the hemorrhagic agent found in improperly cured sweet clover hay, is dicoumarin

(C_{19} H_{12} O_6). This substance causes a progressive reduction in the amount of prothrombin while not affecting the platelets, the blood calcium level, or the vitamin K.

Avitaminosis K can be readily produced in chicks experimentally, but is not a common cause of trouble in farm flocks. Because of a failure of liver function during the first few days of life, there may be insufficient bile present to permit adequate absorption of the vitamin K present, or, in cases of severe diarrhea, the intestinal contents may be evacuated so rapidly that absorption is not possible, but under conditions of proper feeding and careful management it is not likely to be important.

Distillers' Dried Solubles

Because their high protein content was of unknown nutritive value, important studies of distillers' dried solubles have been made to determine the place this voluminous waste should be occupying in the feeding of livestock and poultry. Up to 1939, its utilization as a commercial feed or supplement was empirical, based upon percentages of protein, regardless of its deficiency *per se*. The critical investigational work carried out on the amino acid and vitamin values of this byproduct of cereal-grain distillation, which had led to the determination of its proper utilization, may be regarded as one of the more significant developments of the war. From knowledge of their deficiency as a sole source of protein, this waste product now may be more accurately fortified for replacing given percentages of the total animal dietary, a gain that may have a far-reaching effect on the reliability of commercial feed. Important work in this connection was done by Hughes and Hauge, of Purdue University.

Pigs kept continually on concrete after they were 10 weeks old, and during 105 days of fattening, gained exactly as much as pigs fattened on pasture, in a Minnesota experiment. Feed consumption was about the same, the pastured pigs eating more corn but less protein and mineral. The cost was higher on concrete, largely because of a 33 per cent labor increase to keep the concrete clean.

Nutrition Notes

Glycogen storage in the liver is promoted by an adequate intake of thiamin.

Dairy cows will eat about 1.5 lb. of good roughage daily for each 100 lb. of body weight.

During 1945, the hens of the United States used about 320,000 tons of calcium to put proper shells on the eggs they laid, the USDA reports.

Rhinitis is more common among pigs that are anemic. The place of calcium deficiency and vitamin A deficiency in the syndrome should be studied and clarified.

When sugar beet pulps were ammoniated and the products fed to cows, they were palatable to cows (if not too dark), and had no influence on milk or butter flavor. —*Beet Technol., (1942): 529.*

Pasture is not a complete feed for milking cows. Good legume pasture should be supplemented at the rate of 3 lb. of grain for each gallon of milk produced. Dry or nonlegume pasture requires 4 lb. of grain per gallon of milk to be properly balanced.

Six important steps for raising healthy chicks are listed by the agricultural extension service of Florida as follows: hatch early, start with clean eggs and chicks, keep brooder houses clean, use clean land, feed balanced rations, and separate pullets from cockerels.

Protein can be saved by feeding it properly. When dairy cows are eating all legume roughage, the grain ration should contain 12 to 15 per cent protein; when half the roughage is leguminous, 15 to 18 per cent; and when none is leguminous, 18 to 21 per cent.

Ketone bodies are produced by the digestion of fats and proteins, and they accumulate when these are used too rapidly. Carbohydrates inhibit the formation of ketone bodies by reducing the metabolism of body fat, not by improving the oxidation of the ketone bodies.

EDITORIAL

The Research Fund

The drive to build up a research fund of a hundred thousand dollars or more for the benefit of the veterinary service is meeting with encouraging response from all parts of the country and from all branches of the profession (*see* pp. 348-49) —encouraging because the remarkable growth of the fund is an expression of devotion to higher learning as an instrument of progress. The complimentary letters received with the contributions are testimonials to the effect that the profession has not lost the determination to help itself in the face of need. Unquestionably, the research fund will grow through the coming years. It should. Coming generations as well as the present one will take pride in an achievement that measures their rating among men of science and of the industry directly involved.

Origin.— But, while agitated over planning and promoting the project, haven't we forgotten to pay tribute to the founder—President Harry W. Jakeman of 1941-42, who drew the blueprint and laid the cornerstone of the project while serving the Association in various capacities: Executive Board, Board of Governors, President-Elect, and President, before the motive had become generalized throughout the membership.

Object.—While in its practical application, the fund is a means of encouraging research-minded young men to qualify for positions in the upper circle of veterinary science, it is *a forward step in education* that will stand apart in the annals of American veterinary medicine like (1) the founding of veterinary colleges in the 1850's, (2) the steps from two-, to three-, to four-year courses (1890-1920), (3) the passage of practice laws (1890's), (4) the abolishing of private institutions (1920's), (5) the university conferences for practitioners (1909—), and (6) the developments in the public veterinary education of the present time. The movement is not an implication of delinquency in the research field. On the contrary, research work has been notable (cattle tick fever, brucellosis, hog cholera, worm parasites, canine distemper, encephalomyelitis).

The movement to establish a research fund in veterinary medicine is timely—as timely as founding veterinary education in the first place. To be blunt, scientific research is mounting in importance faster than personnel in our field is being provided. The research fund should become of record as an effort of the veterinarians of the 1940's to narrow, if not entirely fill, that gap.

The Predictable Result.—To predict the results of the movement, one has but to envisage the future of livestock farming and poultry growing, the phenomenal growth of the dog industry, the coming of a more and more food-conscious world, and the part research will be taking in solving the multiplying problems of animal pathology. The foreseeable Utopia is sufficient specialized personnel to man the research laboratories and leaderships of animal science, an end that will take the veterinary profession to a long-sought level and concurrently provide the people with a service competent not only *to solve* but *to conceive* the scientific problems confronting the source of their subsistence.

Knowledge of trees and flowers and farm crops has been long and extensive but speaking acquaintance with molds and fungi is but a few months old, notwithstanding that the mold family (Basidiomycetes) has about 30,000 varieties. There are but two mold-culture collections in the world—one in Holland which escaped destruction during the war and the other in Washington, D. C.—*From the Wall Street Journal, Nov. 19, 1945.*

Plagues from the Orient and Elsewhere

Capt. Paul Withington, former Hawaiian physician, writing as an officer of the Navy, is quoted in the newspapers as declaring "The United States is sitting on a volcano of disease from the Orient which might erupt in a major epidemic at any time," and in the same dispatch, San Francisco health officials are said to be urging universal vaccination to stop an outbreak of smallpox of Oriental origin. No particular plague is mentioned by Capt. Withington but, obviously, bubonic plague, against which California health authorities have protected this country for years by scientific methods of prevention, is one of them.

That pestilence, the fourth Horseman of the Apocalypse, rides again, just as John the Apostle predicted for all great wars in his unsanctioned addendum to the New Testament. It is confirmed in every comprehensive medical report of this hour as well as in the scareheads of the newspapers. Varying in degree and expanse (according to the war itself), the prophetic warning has been true on every count since the Apocalypse was written (1st century A.D.). World War II tops all previous wars in expanse and, if not in the percentage of contemporary territory and people involved, it most certainly leads all others in essential property wasted and destroyed, people dislocated and massacred, and acreage scorched. Since, in planned bestiality, all prior wars were but exciting distractions compared with World War II, and loss of life and property reached incomputable heights, there is no reason in sight for flouting the danger. If the advancements in medical science and nutrition are held out as bulwarks against famine and pestilence, they may be offset by the rapidity of intramundane transportation and the habit of flouting at the danger in sight until it's too late.

Of animal plagues which the vigilance of the federal Bureau of Animal Industry have kept out of this country, rinderpest and foot-and-mouth disease appear to be the greatest threats to our food supply. In our field, "flouting" can be used advisedly. The other day (on Jan. 7, 1946) when Dr. Stanton Youngberg, former director of agriculture in the Philippines who spent forty years in the extermination of rinderpest in that insular possession, wrote the United Nations Relief and Rehabilitation Administration about the danger of bringing that disease back to the islands through the proposed rehabilitation of Philippine agriculture by shipping cattle from rinderpest-ridden China, he was not even accorded the courtesy of a reply—a kind of hunch that rinderpest is of little consequence to the UNRRA. An organization set up to do the job of postwar rehabilitating in the Philippines has surely thrown its machinery in reverse gear if it brings rinderpest back to that not-so-happy agricultural people. But, presumably, to the UNRRA that's only an animal disease, not worth bothering about in this day of mechanical farming. Certainly, if warning from such figures as Youngberg and Kelser and Boynton and Wood are bypassed, there is nothing to do about it 'til the disease gets underway and another 40-year plan for its eradication is launched to rehabilitate Philippine farming. Veterinary medicine, in its relation to world welfare, still needs a lot of advertising in our official and popular circles in view of this evidence that the potentiality of a farm-animal disease like rinderpest is an "X" in a program of postwar reconversion.

In a conversation covering postwar plagues, a spokesman pointed out that no plagues followed World War I (1914-1918) which is about as true as $2x2=0$. Before World War I, undulant fever (human brucellosis) was not known to occur anywhere in the world except on a restricted area related to the Mediterranean littoral, but after millions of men scattered to the four winds following that little international misunderstanding, undulant fever began to take on the character of a world-wide plague. You may flout that one off as a mere coincidence but the fact itself forever will remain for the medical historians to ponder. The presumption that human brucellosis was always here and not recognized (as some physicians openly declare) doesn't make sense. Anyhow, in this place, it is not believed that the physicians of the whole world, except those of southern France and the Island of Malta, were that

stupid. That undulant fever marched out of the battlefields and rest zones of France with returning soldiers seems to be the better type of reasoning.

The war between the states gave this country a flare of bovine contagious pleuropneumonia, unprecedented outbreaks of hog cholera, and the most deadly epizoötic of equine influenza on record, not to mention important flares of Texas fever in northern states.

Rabies in the United States

The leading article in this issue, entitled "The Control of Rabies" and recently released for publication by a special committee of the National Research Council for the purpose of drawing attention to the critical situation that rabies, especially of dogs, is creating in the United States, sets down the pattern required for its extermination.

The incidence of rabies is mounting to nonsensical heights in the face of incompetent control measures. Dogs, cats, farm animals, wildlife, and human beings are stricken down with the most dreadful of all diseases in ever increasing numbers. Of the 10,540 cases recorded in 1944, 53 were in man and 9,067 in dogs. Inhuman as it is to mention human life comparatively under such circumstances, the 53 actual cases, and about 30,000 other persons required to undergo the unpleasant 21-day treatment, brought suffering and anxiety to that many persons and their families, not to mention many more diagnostic examinations at health department laboratories. During the period, 1938-1944, for which statistics are tabulated, there were 257 human, and 59,979 animal, deaths, representing a maze of agony that ought to arouse the feeling of the most sordid heart.

Ignoring the cases that do not reach the statisticians, the figures representing the known victims are high enough to bring rabies among the major problems of preventive medicine. Moreover, in the civilized United States where mastering animal disease has been a veriable obsession for no less than sixty years, the increasing incidence of rabies (to be admittedly rude) is a blur on the escutcheon of the responsible agencies, and the incompetent control in vogue is a burlesque on the impotence of applied science that Common Sense will have to step in and stop in the public interest, regardless of silly sentimental values attached to the main culprit—and for its own benefit. *What a stroke of humanity it would have been to have saved* 9,067 *dogs from the horrendous agony of death from rabies last year,* let alone the 53 persons and the other animals enumerated above: 561 cattle, 419 cats, 43 hogs, 40 sheep, and 32 horses.

The instrument for exterminating rabies has been within the reach of human hands for more than fifty years. The National Research Council has cut the pattern. Will the veterinary service be equal to the task of using it?

When, in the 1880's, Drs. James Law, D. E. Salmon, J. H. Detmers, and others, after failing to stop the spread of lung plague (bovine contagious pleuropneumonia) wrote their classical reports to the Commissioner of Agriculture, emphasizing that *animal plagues cannot be controlled in the United States by independent action of the states but must be brought under central direction,* they laid down the principle that led Congress to create the U. S. Bureau of Animal Industry. The payoff was almost immediate and never ceased. The details are common knowledge in the field of farm-animal production.

By no quirk of the imagination can rabies be set apart as an intelligently conceived exception to the principle laid down by these distinguished scientists and their successors.

Honest differences of opinion are stimulating and signify a wholesome condition. But, thinks C. E. Hughes (*Successful Farming,* February, 1946), there is a need for forgetting all the factionalism, narrow-mindedness, political expediency, and plain pooh-bah that have characterized many of the expressed thoughts on brucellosis. He says we are making headway.

The peak of the horse population of the United States was reached in 1915 with 21,431,000. The present horse population as given by the USDA is 8,259,000, the lowest since 1871. The per capita value is given as $57.30, a decline of $8.00 from that of a year earlier. Of mules there were 3,196,000, as of Jan. 1, 1946.

CURRENT LITERATURE

ABSTRACTS

Animal Sources of Human Ringworm

Although little cultural work has been carried out to determine the type of fungi responsible for the increasing incidence of ringworm, particularly of the scalp, the authors, on the basis of their tests, believe that animal sources are more common than is generally suspected. Out of 211 isolations of Microsporum from school children of southern England and Wales, 122 (58%) were animal types, namely: *M.lanosum* and *M.felineum*. The dog and the cat were, therefore, responsible to that extent. In another investigation, an adult and four children were found to have been infected by a pup which had also infected a cat and four other children indirectly. Trichophyton which is sometimes contracted from calves in rural districts was not found in urban institutions. In another series of 45 human cases, 16 were due to animal fungi.

In general, it was noted that human types are transmitted from man to man, and animal types from animal to animal. When the contagion spreads from animals to man, it does not generally infect other persons, nor are human types contracted by animals likely to spread among other animals. Ringworm contracted from animals was mild, yielding promptly to a 6 per cent sulfur-salicylic ointment, and was clinically distinguishable from primary human infections by their inflammatory and definitely pustular character.—[*B. A. Thomas, M. Lennox, and J. T. Duncan: The Rôle of Animal-Type Dermatophytes in Human Ringworm, Brit. Med. J. Condensed from Vet. Rec., 58, (Jan. 12, 1946): 18.*]

Penicillin in Pyelonephritis

Hematuria and colicy pains are the most diagnostic symptoms of this disease, but the finding of *Corynebacterium renale* is necessary to establish a diagnosis of infections cystitis and pyelonephritis. On the basis of treating six cows, each with 10 million units of penicillin sodium (300,000 units intramuscularly every four hours until 10 million units had been administered), it was found that clinical improvement was noted, with disappearance of hematuria and other symptoms. Of these six cows one has again shown hematuria, two have *Corynebacterium renale* in the urine, and three seem to have made complete recoveries. Because of the chronicity of the disease and the tendency for cases to improve clinically without treatment, it might be premature to assume actual cures, but the penicillin solution appeared to have definite value in the treatment of this condition.—[*John D. Beck, Thomas DeMott, and W. D. Boucher: A Report of Six Cows With Infectious Cystitis and Pyelonephritis Treated With Penicillin. Univ. of Pennsylvania. Vet. Extension Quart., No. 100, Oct. 16, 1945.*]

Zinc Poisoning in Cattle Following Welding in the Barn

During remodeling of a barn that housed 60 head of cattle, the acetylene welding of galvanized iron produced a white smoke that spread over the barn. No ventilation was provided. On the second day of the work, a pregnant cow showed loss of appetite, marked dyspnea, and, finally died in twelve hours. Seven other pregnant cows became ill with high temperatures, loss of appetite, and dyspnea. Postmortem examination of the animal that succumbed revealed extensive interstitial emphysema and atelectasis in both lungs and mediastinum. When the welding was discontinued and the building thoroughly aired out, the sick animals recovered. A similar case described as zinc poisoning due to fumes from welding galvanized iron in a barn was reported by Johansson in the *Svensk Veterinar Tidsskrift*, No. 5, 1942. —[*Erland Hoffman: Zinc Poisoning in Cattle Following Welding in the Barn. Skand. vet.-tidskr., 33, (1943): 84-87.*]

ALFRED G. KARLSON

Prepartum Milking

Workers at the Pennsylvania Experiment Station have reported benefits from prepartum milking of cows. The following advantages are listed: no cow was injured by premilking; it is possible to eliminate edematous conditions of the udders and bellies of heifers and cows; prepartum milking may prevent milk fever and mastitis if started five or more days before freshening, cows premilked could be brought to full feed more rapidly than cows not so milked;

premilking appears to increase total milk yield slightly; and heifers were more easily broken to milk when the udders were not inflamed. The authors note that calves fed milk from prepartum milked cows sometimes need extra vitamins.—[*Work of E. A. Keyes and J. J. Reid, Pennsylvania. Exper. Sta. reported in Holstein-Friesian World, Feb. 2, 1946.*]

Arthritis in Pigs

In a survey of arthritis in pigs, nearly a fourth of the field cases were undiagnosed. An active agent was isolated from cases of this nature, and it was located by studying pigs with sore joints in which no evidence of erysipelas was found.

In artificially exposed pigs the agent produced arthritis, peritonitis, pleurisy, and pericarditis. It is presumed to be a virus (although this has not been definitely established) and has been compared with several known viruses (influenza) without establishing any relationship.—[*S. H. McNutt, T. S. Leith, and G. K. L. Underbjerg: An Active Agent Isolated from Hogs Affected with Arthritis. Preliminary Report. Am. J. Vet. Res., 6, (1945): 247-251.*]

BOOKS AND REPORTS

Penicillin in Veterinary Medicine

This brochure discusses the discovery and development of penicillin, its antimicrobial action against the various types of bacteria, the methods of administration, a summary of dosages used in the therapy of mastitis by workers who have done experimental work, and a bibliography which lists titles of articles suitable for additional study.—[*Penicillin in Veterinary Medicine. 20 pages. Merck & Co.*]

The Bacterial Cell

The contributions to the science of microbiology from Professor Dubos of the Harvard Medical Schools and Rockefeller Institute of Medical Research, which veterinary medicine has been able to seize to incomputable advantage, are not escaping notice in our field, notably his work on ultracentrifugation, electron microscopy, and the chemistry, structure, cytology and virulence of the bacterial cell, not to mention bactericidal agents. While in this book the author mostly addresses the laboratory worker, much of the output of his analytical mind has bloomed right in the hands of the practitioner. Critical review of this book is left, severely, to the field of scientific research. It blazes new trails through unexplored ground into which only the more audacious casuals would venture. Historically speaking, however, it fascinates even the novice. Bacteriology, a relatively young science, had lost itself in the wilderness of unknowns and became extremely drab until physics and chemistry came to the rescue and created new sources of useful information of the "must know" type. *The Bacterial Cell* is, therefore, not a dull book in any medical company. It sheds bright rays on functionating matter previously sought but unseen.—[*The Bacterial Cell. By Rene J. Dubos. 460 pages. Harvard University Press. 1945. Price, $5.00.*]

The Use of Urea and Ammonium Salts as Substitutes for Protective Proteins in Feeding Dairy Cows (Title Translated and Abridged.) Parts I and II.

These two booklets testify to the determination to overcome the shortage of protein feeds in the dairy regions of Europe during the war. They have historic, economic, and scientific character verging on mental anguish. They symbolize desperate effort under trying circumstances, as well as classical work and good reporting. The trials were carried out at the experimental farm of "Aliment Protector", under the control of the Department of Agriculture and Provisions of Belgium. The research was a continuation of work begun in 1939 by Professor Molhant of Louvain, in anticipation of a deficiency of protein materials for feeding the cattle of that country. From Germany there had come reports of feeding 150,000 tons of urea per month to some 2,000,000 head of cattle but integrated results were not given, nor were the trials of sufficient duration to be convincing to critical nutritionists.

The first trial lasted from July through October, 1941, using three groups of cows: (1) to receive urea, (2) to receive bicarbonate of ammonia, and (3) controls. The precise poundage of the basal ration, the needs in minerals and vitamin A, and the health of the animals characterize the extensively tabulated reports of the results.

Part II reports experiments of the same genre with ammonium chloride, ammonium bicarbonate, and urea lasting from November, 1941, through August, 1942, which led to definite conclusions as to the food value of these chemicals as substitutes for proteins.

These two books should be of inestimable value to workers in the field of animal nutrition and of the commercial feed industry. The material is well organized and presented.—*Expérience sur l'utilisation de l'urée et du bicarbonate d'ammoniaque dans l'alimentation des vaches laittière. By G. Dubois. Part I. 123 pages. Illustrated. Graphs, charts, tables. Periodica. Brussels, Belgium. Part II. Compte rendus des expérience sur l'utilisation d'azote d'origine synthetique ibid.*

THE NEWS

Plans for Eighty-Third Annual Meeting in Boston Taking Shape

Although the 1946 AVMA meeting is nearly four months away, program arrangements are already well advanced. The Committee on Local Arrangements at its second meeting on March 27, completed membership appointments to committees and subcommittees; several matters relating to the entertainment of delegates and their wives were also tentatively provided for. The Committee met again on April 24 to develop further details of what promises to be one of the outstanding meetings of all time.

Section Programs To Be Resumed

The Committee on Program (Section Officers, *ex officio*) has submitted tentative assignments for topics and speakers, including panel discussions and symposiums. This year, the six sections (General Practice, Sanitary Science, Small Animals, Research, Surgery and Obstetrics, and Poultry) will hold meetings for the first time since 1942. However, an innovation in scheduling the sectional programs will be introduced so that only three sections will be in session at one time, thus avoiding much of the confliction of previous years and enabling veterinarians to listen to many papers and discussions that they would otherwise miss. Section meetings will therefore be held on two days instead of one, as previously was the custom, as

Officers and Committee Chairmen of Committee on Local Arrangements for Boston Session

Seated (left to right)—Dr. E. F. Schroeder, Publicity and Public Relations; Dr. B. S. Killian, Entertainment; Dr. E. A. Woolffer, General Secretary; Dr. E. M. Aldrich, General Chairman; Dr. G. B. Schnelle, Vice General Chairman; Dr. H. W. Peirce, Reception; Dr. J. G. Hardenbergh, Executive Secretary, AVMA.

Standing (left to right)—Dr. J. J. Murphy, Jr., Meeting Rooms and Equipment; Dr. Cornelius Thibeault, Registration and Information; Dr. A. H. Russell, Exhibits; Col. R. S. Youmans, Military Activities; Dr. W. H. Shannon, Hotels and Housing.

Not present when picture was taken—Dr. H. W. Jakeman, Honorary Chairman, and Mrs. J. J. Murphy, Jr., Chairman of Subcommittee on Women's Activities.

shown in the tentative general plan published below.

HOTEL RESERVATIONS

Members are urged to study the outline in timing their arrival in Boston, especially in connection with hotel accommodations. A reservation blank will be found on advertising page xxiv of this JOURNAL, listing types of rooms available at several hotels.

PRELIMINARY MEETINGS

In addition to the tentative schedule shown in the program outline, it is probable that meetings of some of the Association's governing bodies and committees will precede those now indicated for Sunday, August 18. These include:

Saturday morning, August 17—Board of Governors.

Saturday afternoon and night, August 17—Council on Education.

Other committee meetings also may be scheduled for this same date.

EXHIBIT FEATURES

Both the Educational and Technical (commercial) Exhibits promise to be of outstanding interest and value. Several veterinary science departments have already indicated their intention to participate. The Veterinary Section of the Army Medical Department exhibit at the San Francisco meeting of the American Medical Association will be sent to Boston; there will also be depictions of some of the hitherto unpublicized wartime research studies on animal and poultry diseases.

The commercial exhibits will set new records in numbers and attractiveness. The participating firms include several newcomers to AVMA conventions. All display space for this feature of the Boston Session was reserved within a week after the official floor plans were released.

Tentative General Plan of Boston Session

	SUNDAY AUGUST 18	MONDAY AUGUST 19	TUESDAY AUGUST 20	WEDNESDAY AUGUST 21	THURSDAY AUGUST 22
MORNING	Executive Board ——— Committee Meetings	Registration ——— Opening of Exhibits ——— House of Representatives (First session)	General Session	(9 to 11 a. m.) Three Section Programs: General Practice; Sanitary Science; Research.	(9 to 11 a. m.) Three Section Programs: General Practice; Sanitary Science; Research.
				(11:15 a.m. to 12:15 p.m.) General Session	(11 a.m. to 12:15 p.m.) General Session Installation of Officers
NOON			Women's Auxiliary Luncheon		
AFTERNOON	Executive Board ——— Advanced Registration ——— Committee Meetings	Opening Session ——— Awards ——— Nomination of Officers	General Session (2 to 4 p.m.) Women's Auxiliary, Annual Meeting (2 to 4 p.m.)	(2 to 4 p.m.) Three Section Programs: Surgery & Obst.; Small Animals; Poultry.	(2 to 4 p.m.) Three Section Programs: Surgery & Obst.; Small Animals; Poultry.
			(4 to 5 p.m.) Clinical Depictions	(4 to 5 p.m.) Clinical Depictions	(4 to 5 p.m.) Clinical Depictions
NIGHT		House of Representatives (Second Session)	Moonlight Cruise ——— House of Representatives (if necessary)	Banquet, President's Reception and Dance	

Progress of The Research Fund Campaign

On the opposite page is a tabulated summary, by states, of the funds so far contributed by individual veterinarians in response to the appeal for a fund to help support research in veterinary science. This is the first report by the AVMA Special Committee on Financing Research since the drive was started in January of this year. The members of the committee are: Dr. J. V. Lacroix, Evanston, Ill., chairman; Dr. W. A. Hagan, Ithaca, N. Y., and Dr. C. C. Hastings, Williamsville, Ill.

As announced at the beginning of the campaign, the first goal set by the committee is a fund of at least $100,000 from members of the profession before soliciting contributions from other sources. In due time, the committee will approach animal lovers, livestock owners, commercial firms, and other interested organizations for donations toward a much larger sum.

The results in states where a more or less organized appeal has been made at the time of veterinary association meetings are reflected in the table. Many states have not yet had an opportunity to organize for the fund drive. In respect to quota standings at the time the table was prepared, the five leading states, in order, are New Mexico (56.9 per cent), Oklahoma (51.8 per cent), California (34.1 per cent), Kansas (25.6 per cent), and Colorado (23.1 per cent).

The preferences so far indicated by donors for allocation of their contributions to the several fields of investigation for which funds can be ear-marked are as follows:

Unrestricted (to be used at the discretion of the Research Council)	$10,637.21
For research on small animals	3,346.16
For research on large animals	2,747.49
For research in the basic sciences	440.33
For research on poultry	172.02
For research on fur-bearing animals	72.00
Total	$17,415.31

Executive Board Candidates Being Nominated in Districts VI and VIII

The terms of Drs. L. M. Hurt, Sierra Madre, Calif., and Ashe Lockhart, Kansas City, Mo., members of the Executive Board from the Sixth and Eighth districts, respectively, will expire at the close of the annual meeting in Boston, Aug. 19-22. Under date of April 1, 1946, ballots were mailed to all members in these districts for nominations which will close on June 1, 1946. The five nominees receiving the highest number of votes in each district will then be listed on an election ballot which will be mailed about June 10.

Dr. Hurt was elected in 1943 to fill the unexpired term caused by the election of Dr. James Farquharson as president-elect, who, in turn, had been elected in the Eighth district for the unexpired term of Dr. W. L. Curtis, deceased. Dr. Hurt represents members in Arizona, California, Colorado, Nevada, New Mexico, Utah, Canal Zone, Central America, and Mexico. He had previously served a full term on the Board from 1931 to 1936.

Dr. Lockhart was elected in 1941 for a full term to represent AVMA members in Arkansas, Kansas, Louisiana, Missouri, Oklahoma, and Texas, the states comprising District VIII. He had also previously served on the Board from 1935 to 1936, during which time he filled the unexpired term of Dr. J. C. Flynn, who had been elected AVMA president in the former year.

Proposed Amendments to Constitution and Administrative By-Laws

At the 1945 business meeting, the following amendments were submitted to the House of Representatives for final action at the 1946 session. They are republished here for the information of members and delegates.

PROPOSAL NO. 1

[The purpose of this proposal is to permit the outgoing president to serve as an *ex officio* member of the Executive Board for one additional year, replacing the present member-at-large, and thus retaining the present number of Board members (13). If this purpose is to be effected, the following several changes in the By-Laws must be made.]

Amend Section 3 of Article II of the By-Laws by adding the following paragraph:

"f) At the conclusion of his term of office, the president shall serve for one year as a member *ex officio* of the Executive Board."

Amend Section 1 of Article VIII of the By-Laws by striking out the words "a member-at-large" and substituting therefor the words "the immediate past president."

Amend paragraph (a) of Section 2 of Article VIII of the By-Laws by striking out the words "and the member-at-large" from the first sentence, and by deleting the entire second sentence of this paragraph.

Amend paragraph (c) of Section 2 of Article VIII by adding the following sentence: "The immediate past president shall serve as a member of the Executive Board for one year only."

Amend paragraph (a) of Section 3 of Article VIII by striking out the words "except in the

(*Continued on page* 350)

First Report on Contributions to AVMA Research Fund

Geographical Breakdown as of April 10, 1946

State	Total Number Veterinarians (1945 figures)	Quota*	Number of Contributions (to date)	Total Amount Contributed (to date)	Per cent of quota (to date)
Alabama	125	$ 1,250	2	$ 20.00	1.6
Arizona	42	420	...	.....	...
Arkansas	59	590	...	.....	...
California	1,044	10,440	202	3,560.00	34.1
Colorado	177	1,770	21	410.00	23.1
Connecticut	136	1,360	7	140.00	10.3
Delaware	32	320	...	.....	...
Dist. of Col.	58	580	1	100.00	17.2
Florida	142	1,420	6	270.00	19.0
Georgia	147	1,470	7	110.00	7.5
Idaho	71	710	7	80.00	11.1
Illinois	1,224	12,240	62	2,045.00	16.7
Indiana	585	5,850	10	240.00	4.1
Iowa	865	8,650	51	1,017.31	11.8
Kansas	404	4,040	35	1,035.00	25.6
Kentucky	137	1,370	4	40.00	2.9
Louisiana	85	850	6	170.00	20.0
Maine	68	680	4	145.00	21.3
Maryland	165	1,650	3	45.00	2.7
Massachusetts	206	2,060	10	140.00	6.8
Michigan	550	5,500	22	385.00	7.0
Minnesota	403	4,030	26	340.00	8.4
Mississippi	99	990	2	75.00	7.6
Missouri	356	3,560	14	245.00	9.7
Montana	63	630	4	55.00	8.7
Nebraska	281	2,810	28	505.00	18.0
Nevada	27	270	2	25.00	9.2
New Hampshire	35	350	2	20.00	5.7
New Jersey	301	3,010	19	350.00	11.6
New Mexico	29	290	8	165.00	56.9
New York	980	9,800	43	725.00	7.4
North Carolina	135	1,350	8	120.00	8.9
North Dakota	73	730	3	135.00	18.5
Ohio	740	7,400	73	1,550.00	20.9
Oklahoma	110	1,100	38	570.00	51.8
Oregon	175	1,750	10	225.00	12.9
Pennsylvania	656	6,560	22	865.00	13.2
Rhode Island	25	250	1	25.00	10.0
South Carolina	80	800	3	30.00	3.7
South Dakota	118	1,180	3	55.00	4.6
Tennessee	93	930	2	35.00	3.7
Texas	420	4,210	18	333.00	7.9
Utah	45	450	7	70.00	15.0
Vermont	96	960	2	20.00	3.1
Virginia	130	1,300	9	140.00	10.8
Washington	226	2,260	15	310.00	13.7
West Virginia	65	650	2	35.00	5.4
Wisconsin	502	5,020	27	430.00	8.5
Wyoming	38	380	1	10.00	2.6
Totals	**12,624**	**$126,240***	**852**	**$17,415.31**	...

*Based on an average contribution of $10.00 per veterinarian.

States having made the best showing have conducted campaigns at meetings.

The total amount contributed to date is 17.4 per cent of the original goal of $100,000.

A few contributions from other countries, not included in this table, will be shown in later reports.

(*Continued from page* 348)

case of the member-at-large, which shall be filled by election at the next general assembly," and by changing the comma after the word "time" to a period.

PROPOSAL No. 2

[The purpose of this proposal is to permit the incorporation of Mexico, the West Indies, and the Panama Canal Zone into Zone 3 of the official apportionment map of areas for AVMA conventions.]

Amend paragraph (b) of Section 1 of Article XI of the By-Laws so that the first sentence will read "Place: The United States, the Dominion of Canada, the Republic of Mexico, the West Indies, and the Panama Canal Zone shall be divided into four convention zones for the holding of annual sessions in such numerical order as to favor alike all sections within the contiguous territory of these countries."

PROPOSAL No. 3

[The purpose of this proposal is to integrate membership in constituent associations (state, provincial, territorial, and other veterinary associations affiliated with the AVMA) with AVMA membership. If this purpose is to be effected, the following several changes in the Constitution and Administrative By-Laws are necessary.]

1) Amend Article III, Section (b) of the Constitution to read:

"*General Membership.*—The general membership, otherwise known as the active membership, shall consist of (1) graduates of veterinary colleges approved by the Association who are members of their respective constituent associations and who have been duly elected in the manner hereinafter provided, and (2) associate members who have been duly elected as provided in paragraph (c) of this article.

"c. *Associate Membership.* — The associate membership shall consist of veterinarians duly elected in the manner provided by the by-laws who live in countries outside of the United States and the Dominion of Canada, and who are otherwise eligible but do not or could not hold membership in a constituent association."

Present paragraph *c)* would become *d)*, and present paragraph *d)* would become *e)*.

2) Amend Article IV, Section 1 of the Constitution to read:

"State, territorial, and provincial veterinary associations of North America, The National Association of Federal Veterinarians and the official association of veterinarians of the United States Army which have or may hereafter become organized in conformity with the general plan of the American Veterinary Medical Association, and which have adopted the same qualifications for membership, shall be recognized upon application as constituent associations provided such application is approved by a majority vote of the Executive Board."

3) Amend Article X, Section 2 a) of the By-Laws as follows:

Drop the last sentence and replace with: "The application shall contain the certificate of the secretary of the constituent association that the applicant is a member in good standing of that body."

"The American Veterinary Medical Association reserves the right to reject the application of any member of any constituent association."

4) Add a new paragraph (b) to Section 3, Article X as follows:

"Members who have been dropped from constituent associations shall be dropped from the American Veterinary Medical Association on official notification by the secretary of the constituent association and shall be reinstated in the same manner. Whenever a member of this Association is dropped for any reason, the secretary of the constituent association in which he holds membership shall be notified promptly."

5) Replace Section 4 of Article X with the following:

Section 4. The applications of candidates for associate membership shall be submitted to the Executive Board and shall be accepted or rejected by that body at any regular or special meeting. Associate members shall have all of the rights and privileges and be subjected to the same obligations as other active members except only that they are not required to maintain membership in a constituent association.

Present Section *4* would then become Section *5*, and present Section *5* would become Section *6*.

6) Amend present Section 5 by making subparagraph (a) a part of proposed new Section 4, and changing last part of this paragraph to read:

"provided they have applied for membership in a constituent association within three months after graduation."

Can You Help Locate These Members?

The aid of JOURNAL readers is solicited in locating the following members, mail to whom has been returned to the Association's central office. The last known address of each is given. Should you be able to provide information as to present residence, your advice *via* postcard or letter will be greatly appreciated.

Adler, Henry E., 1812 B. St., Pullman, Wash.
Altaker, Robert R., 15th Vet. Sec. Aviation, APO 696, c/o P.M., New York, N. Y.
Amstutz Harold E., Co. E 28 TB B.T.G., Camp Crowder, Mo.
Antroinen, A. P., Box 231, Brewster, Minn.
Balle, Edwin G., Apt. 109, 1205 Pallister, Detroit 2, Mich.

Beggs, Wm. E., Vet. Co. 10th Mt. Med. Bn., APO 345, c/o P.M., New York, N. Y.
Benedict, Melvin C., 0-523538, 285 Signal Pigeon Co., APO 655, c/o P.M., New York, N. Y.
Berdan, L. N., APO 21086, c/o P.M., New York, N. Y.
Bishop, Vincil C., K. C. ASF Depot, Kansas City, Mo.
Bonneville, E. J., 135 S. Swall Dr., Los Angeles 35, Calif.
Brands, Frank J., 388 Saint Johns Place, Brooklyn 17, New York.
Brekke, A. F., Service Unit 1699, Chicago 6, Ill.
Brennan, James A., 0-351618, Med. Sec., Hdqs. Brittany Base Sec., Com. Z ETO, APO 517, c/o P.M., New York, N. Y.
Brenny, Raymond N., Camp Clark, Nevada, Mo.
Bush, Frank J., 34 Berkley St., Lawrence, Mass.
Campbell, T. C., 117 N. W. 17th, Oklahoma City, Okla.
Chambers, J. W. Jr., 111 E. Woodin, Dallas, Texas.
Christopher, R. E., Box 72, Dysart, Iowa.
Collins, Elizabeth J., 25 W. 68th St., New York 23, N. Y.
Collins, H. R. Jr., Air Corps Base Flying Schl., San Angelo, Texas.
Collinson, R. L., Aurora, Mo.
Cox, Erston S., Blountsville, Ala.
Davis, James J., 161 E. High St., Carlisle, Pa.
Davis, Richard H. Jr., 36th Vet. Co. (Sep), APO 464, c/o P.M., New York, N. Y.
Dean, Wm. D., 2610 Q.M. Remount Depot, APO 782, c/o P.M., New York, N. Y.
Deubler, James A., 55th Vet. Det., F.A., Hdqs. CC & CC, APO 627, c/o P.M., New York, N. Y.
Devine, Kenneth D., 904th Vet. Det., APO 690, c/o P.M., New York, N. Y.
Dieterich, W. H., Office of Military Governor, Bureau of Pub. Health and Welfare, Dept. of Vet. Affairs, Seoul, Korea.
Elmer, Everett K., D Co., 2nd Bn., Camp Wheeler, Ga.
Ferreira, Conrad J., 2050 Railroad Ave., Redding, Calif.
Ferguson, F. G., MTB Ron. 24, c/o FPO, San Francisco, Calif.
Ferrell, Edwin H., Morrilton, Ark.
Fireoved, D. W., 83rd Vet. Food Insp. Det., APO 214, c/o P.M., New York, N. Y.
Flagg, Dean E., Wyanet, Ill.
Flanigan, Jean A., U. S. Joint Purchasing Bd., FPO 113, c/o P.M., San Francisco, Calif.
Foley, Randall J., 0-499669, APO 22955, c/o P.M., San Francisco, Calif.
Foote, Lon E., W.A.A.F., Waco, Texas.
Frederickson, James L., Manteca, Calif.
Freid, N. T., 01754904, 1971 S.C.U. Vet. Div., Barnes Gen. Hosp., Vancouver, Wash.
Fretz, Warren J., 1047 Post Office Bldg., St. Paul 1, Minn.
Furgeson, H. E., c/o American Embassy, APO 879, c/o P.M., New York, N. Y.
Gemberling, Arthur R. Jr., 44th Vet. Co. (Sep) APO 17070, c/o P.M., New York, N. Y.
Gillespie, Richard J., Vet. Hosp., Fort Bragg, N. Car.
Gillet, Veronica, 521 S. Valencia Dr., Albuquerque, N. Mex.
Green, L. Kenneth, 108 Davis Ave., Auburn, Maine.
Grissam, Garner J., Big Springs, Texas.
Grimes, Geo. E., 1560 SCU, Camp Atterbury, Ind.
Grueter, H. P., Office of Station Vet., Camp Mackall, N. Car.
Haight, Robert H., 108th Med. Com. Sec., APO 922, c/o P.M., San Francisco, Calif.
Hansell, Wm. H., 0-1784972, 61st Vet. Det. (FA) Hdqs. CCC, APO 627, c/o P.M., New York, N. Y.
Harlan, Wm. H., Hdqs. 2nd Armoured Div., APO 252, c/o P.M., New York, N. Y.
Hart, Joel T., 6220 Woodlawn Ave., Chicago, Ill.
Hays, I. M., 520 Third St., Girard, Ill.
Henderson, F. E., 2900 W. Sixth St., Little Rock, Ark.
Hensell, Wm. H., 61st Vet. Det. (FA) Hdqs. CCC, APO 627, c/o P.M., New York, N. Y.
Hoadley, R. E., W.P.A.G.F., Replacement Depot 2, Fort Ord, Calif.
Howder, John W., 66th Vet. Food Insp. Det., APO 782, c/o P.M., New York, N. Y.
Howard, Jack H. Jr., Vet. Off. Repl. Pool, C.Q.M.D, Chicago, Ill.
Hughes, W. Allen, 0-516390, 602nd F. A. Bn. Pack, APO 758, c/o P.M., New York, N. Y.
James, Harry P., 0-1755281, 1st Vet. Co. (Sep) USAF Remount Depot, APO 495, c/o P.M., New York, N. Y.
Jones, Russell K., c/o L. B. Tucker, Purchase Rd., Rye, N. Y.
Judson, W. W., c/o John F. Codie, Apartado 2776, Mexico City, Mex.
Juzek, H. J., Hdqs. 11th Port, Camp Plauche, New Orleans, La.
Kaplan, Martin M., UNRRA Greece Mission, APO 512, c/o P.M., New York, N. Y.
Kelsey, E. E., Chatsworth, Ill.
Kendall, O. Kenneth, Washington, Kan.
Kerns, Robert L., Div. Hdqs., U. S. Army Forces, APO 469, c/o P.M., New York, N. Y.
King, Roland, Pasadena, Calif.
Kress, Joseph D., 3812 Granada Ave., Baltimore 7, Md.
Lasher, N. A., Base Vet., AAF Sta. Hosp., 1379th AAF BU, NAD-ATC, Dow Field, Bangor, Maine.
Linder, R. O., West Salem, Ohio.
Lukens, Wm. M., Sta. Vet., Sta. Hosp., Kingman AAF, Kingman, Ariz.
McConn, F. J., Fayetteville, Ohio.
McGrath, Harold B., ASF PRD, Fort Jackson, S. Car.

(Can You Help Locate These Members—Continued)

McMichael, Wm. W., Army Air Base, Portland, Ore.
McMillan, Thomas O., Wichita Falls, Texas.
Mack, Ernest J., 6565 Vet. Det., APO 650, c/o P.M., New York, N. Y.
Majilton, E. A., Rhoades Gen. Hosp., Utica, N. Y.
Maude, Stuart H., 44th Vet. Det. F. A., Hdqs. C. T. & CC, APO 627, c/o P.M., New York, N. Y.
Metcalfe, E. L., APO 4287, c/o P.M., New York, N. Y.
Meyers, Ivan S., 180 N. Jefferson St., Martinsville, Ill.
Miller, M. W., 425 Maryland Ave., St. Louis, Mo.
Moffat, G. C., Centuria, Wis.
Mohney, Leonard W., Mira Mar Hotel, 6220 S Woodlawn Ave., Chicago, Ill.
Moody, Robert A., 0-369400, Procurement Div., Vet. Sec. Br. 2, APO 923, c/o P.M., San Francisco, Calif.
Morgan, Richard B., 605 F. A. Bn., APO 345, c/o P.M., New York, N. Y.
Morse, C. F., 155 124th Ave., San Francisco, Calif.
Morton, L. R., 285 Q.M. Ref. Co. F, Camp Lee, Va.
Moss, Ben F. Jr., Eastanolle, Ga.
Moughon, William C., Box 609, El Campo, Texas.
Ogilvie, Fred B., Officers Repl. Bn., ASF PRD, Camp Beale, Calif.
Peacock, Charles G., 1406 Eslava St., Mobile 19, Ala.
Penwell, Park H., 68 Q.M. Base Depot, APO 228, c/o P.M., New York, N. Y.
Persichetti, Karl, Gen. Depot G-45, APO 205, c/o P.M., New York, N. Y.
Prendergast, W. B., Hdqs. 28 Hosp. Center, c/o Surgeon, Base H, APO 920, c/o P.M., San Francisco, Calif.
Price, Lawrence W., AAFAFS, Frederick, Okla.
Propp, Harold, APO 11331, c/o P.M., New York, N. Y.
Reynolds, F. H., 1st Med. Gen. Lab., APO 519, c/o P.M., New York, N.Y.
Richter, C. M., 0-357116, Hdqs. 5th PE, APO 228, c/o P.M., New York, N. Y.
Ricker, H. Glenn, Jr., 84 Gainsborough St., Boston, Mass.
Roberts, N. C., Fort Omaha, Neb.
Rubenstein, Abraham M., 1251 Euclid Ave., Miami Beach 39, Fla.
Russ, Robert S., 120 S. Van Brunt, Kansas City 1, Mo.
Sarde, Robert M., Vet. Det., APO 4819, c/o P.M., New York, N. Y.
Scheffler, Harold G., Stark Gen. Hosp., Charleston, S. Car.
Schmidt, Martin G., Hdqs. Depot 2-111, APO 813, c/o P.M., New York, N. Y.
Schoen, Edwin A., 1209 Covedale, Cincinnati, Ohio.
Sedlacek, G., 218 Centennial Bldg., Springfield, Ill.
Stansbury, Robert L., 2208 Santa Monica Blvd., West Hollywood 46, Calif.
Stiern, Walter W., 0-360765, 2nd Vet. Co. (Sep) APO 689, c/o P.M., New York, N. Y.
Stockton, Albert E., Hdqs. CCC, APO 627, c/o P.M., New York, N. Y.
Sunderville, E. J., Med. Sec. M 1, Govt. Hdqs. 8th Army, APO 343, c/o P.M., San Francisco, Calif.
Taylor, Clarence L., Hdqs. 6th Sev. Com., Chicago, Ill.
Ten Broeck, Charles W., Gen. Del., Alpena, Mich.
Thompson, Charles F., 603 22nd St., N.W., Washington 7, D. C.
Upchurch, John W., Hdqs. 8th P.O.E., APO 780, c/o P.M., New York, N. Y.
Valentine, H. D., Med. Det., Sta. Hosp., Rosecrans Field, St. Joseph, Mo.
Vandeven, John W., Swift & Co., Alma, Mich.
Van Houweling, C. D., Q.M. Market Center, 10th Ave. & 11th St., Columbus, Ohio.
Vansant, Allen S., 216 Repl. Co., APO 291, c/o P.M., San Francisco, Calif.
Walker, Johnnie E., 62nd Vet. Det. F. A. CCC Hdqs., APO 627, c/o P.M., New York, N. Y.
Warren, D M., c/o W. Eshelman & Sons, Circleville, Ohio.
Wiles, S. D., 428 E. Washington St., Ft. Wayne, Ind.
Williams, J. M., Sq. M, 420th AAB Unit, Maxwell Field, Ala.
Wolfe, Gerald, 712 Miller Ave., Columbus 5, Ohio.
Wolfe, John, Whittenberg, Wis.
Wood, H. W., Steiner St., San Francisco, Calif.
Wyatt, D. Henry, 28 Valley St., Pasadena 3, Calif.
Zimdahl, Robert O., Sta. Hosp., Orlando Air Base, Orlando, Fla.

APPLICATIONS

EMILIANI R., ENRIQUE
Apartado Nacional 51, Cartagena, Colombia, S. A.
V.M., Facultad de Medicina Veterinaria, Universidad Nacional de Colombia, 1942.
Vouchers: C. A. Rojas and H. Almanza R.

EMMERSON, JAMES H.
61 Hancock St., North Quincy, Mass.
D.V.M., Iowa State College, 1930.
Vouchers: L. A. Paquin and J. H. O'Brien.

HENRY, LEO M.
1420 So. 38th St., Milwaukee 4, Wis.
D.V.M., Iowa State College, 1927.
Vouchers: S. L. Hendricks and V. V. Martinson.

HENSHAW, MILO J.
403 S. Ionia St., Albion, Mich.
D.V.M., Michigan State College, 1937.
Vouchers: H. H. Ruhland and F. Thorp, Jr.

JOHNSON, STEPHEN N.
521 So. Clinton, Dallas 11, Texas.
D.V.M., Texas A. & M. College, 1944.
Vouchers: E. D. Stoddard and R. E. Starnes.

LOVELL, V. E.
Pender, Neb.
D.V.M., Kansas City Veterinary College, 1914.
Vouchers: A. G. Beagle and J. E. Peterman.

SCALES, JAMES W.
Box 536, State College, Miss.
D.V.M., Michigan State College, 1934.
Vouchers: I. S. McAdory and E. H. Durr.

STUDER, SEBASTIAN N.
6640 Lindenwood Pl., St. Louis 9, Mo.
D.V.M., Colorado State College, 1933.
Vouchers: R. V. Rafnel and C. C. Walch.

WONG, TIT
UNRRA, Greece Mission, APO 512, c/o P.M., New York, N. Y.
D.V.M., Kansas State College, 1938.
Vouchers: W. M. Mohler and L. T. Giltner.

Second Listing

Aguilera, Pablo, Casilla 537, Santiago, Chile.

Anderson, Collins W., 914 W. National Ave., Milwaukee, Wis.

Bannister, G. L., c/o Ontario Veterinary College, Guelph, Ont., Can.

Brock, J. C., Pelham, Ga.

Carlton, Robert E., 4743 Walnut St., Philadelphia 39, Pa.

Cole, C. G., P. O. Box 70, Ames, Iowa.

Eagelman, James G., Wernersville, Pa.

Edge, Garth A., 160 Redpath Ave., Toronto, Ont., Can.

Gasow, Fred H., 1521 N. Woodward, Birmingham, Mich.

Haubrich, Leonard R., Claremont, N. H.

Hess, Geo. W., 316 Landrey St., Hillsboro, Ill.

Laidlaw, A. M., c/o Dr. C. P. Zepp, 136 W. 53 St., New York 19, N. Y.

Parmiter, Frederick, 25 Mount Pleasant Ave., Ottawa, Ont., Can.

Van Nocker, Kenneth C., 614 N. Main St., Bellevue, Mich.

Zacherle, George H. Jr., Hq. Army Medical Schools, Fort Sam Houston, Texas.

1946 Graduate Applicants

First Listing

The following are graduates who have recently received their veterinary degrees and who have applied for AVMA membership under the provision granted in the Administrative By Laws to members in good standing of junior chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Alabama Polytechnic Institute

ACREE, JAMES A., D.V.M.
1234 Challen Ave., Jacksonville 5, Fla.
Vouchers: W. E. Cotton and J. K. MacNamee.

AMY, J. PHILIP JR., D.V.M.
P. O. Box 324, Iota, La.
Vouchers: I. S. McAdory and W. E. Cotton.

ASHLEY, BAINE G., D.V.M.
P. O. Box 512, Apopka, Fla.
Vouchers: E. S. Winters and B. M. Jolly.

BOOZER, HAROLD W., D.V.M.
R.F.D. No. 2, Jacksonville, Ala.
Vouchers: W. W. Bishop and E. S. Winters.

CULPEPPER, MOLEY D., D.V.M.
Cusseta, Ga.
Vouchers: W. W. Bishop and W. E. Cotton.

DAVIS, ERWIN D., D.V.M.
1519 W. Court St., Gainsville, Fla.
Vouchers: W. W. Bishop and E. S. Winters.

DUCKWORTH, JOHN F., D.V.M.
Greenville, Tenn.
Vouchers: I. S. McAdory and W. E. Cotton.

HART, CLIFTON L., D.V.M.
Marianna, Fla.
Vouchers: I. S. McAdory and W. E. Cotton.

HUFF, JAMES M., D.V.M.
McCrory, Ark.
Vouchers: W. E. Cotton and I. S. McAdory.

JOHNSON, KIBBY K., D.V.M.
506 Moreland Ave., N. E., Atlanta, Ga.
Vouchers: I. S. McAdory and W. E. Cotton.

JORDAN, JAMES E., D.V.M.
P. O. Box 208, Carrollton, Ala.
Vouchers: R. S. Sugg and I. S. McAdory.

KIRBY, ROBERT A., D.V.M.
615 S. 84th St., Birmingham, Ala.
Vouchers: R. S. Sugg and W. E. Cotton.

KRONFELD, GELFER, D.V.M.
Herndon, Va.
Vouchers: E. S. Winters and B. M. Jolly.

LANCASTER, RODMAN L., D.V.M.
Vanceboro, N. Car.
Vouchers: W. W. Bishop and E. S. Winters.

LINDSEY, HERBERT F., D.V.M.
403 Terracedale, Griffin, Ga.
Vouchers: W. W. Bishop and E. S. Winters.

MCCARTY, GEORGE F. JR., D.V.M.
934 N. Broadway, Knoxville, Tenn.
Vouchers: W. W. Bishop and W. E. Cotton.

PETERS, ORIN C., D.V.M.
Box 725, Auburn, Ala.
Vouchers: W. W. Bishop and W. E. Cotton.

PHELPS, GUY J. JR., D.V.M.
108 N. Lawrence St., Montgomery, Ala.
Vouchers: W. E. Cotton and I. S. McAdory.

POWELL, JAMES C. JR., D.V.M.
Waynesboro, Ga.
Vouchers: B. M. Jolly and W. W. Bishop.

SAPP, CLARENCE C. JR., D.V.M.
519 Pine Ave., Albany, Ga.
Vouchers: B. M. Jolly and E. S. Winters.

SHIRER, WILLIAM H., D.V.M.
Gastonia, N. Car.
Vouchers: W. E. Cotton and I. S. McAdory.

SIBLEY, NEAL J., D.V.M.
Russeville, Ala.
Vouchers: W. E. Cotton and I. S. McAdory.

SMALLEY, FRARIE C., D.V.M.
122 Elm St., Dublin, Ga.
Vouchers: W. W. Bishop and E. S. Winters.

STAPLETON, ROBERT T., D.V.M.
605 Harrold Ave., Americus, Ga.
Vouchers: W. E. Cotton and I. S. McAdory.
TINSLEY, HAROLD D., D.V.M.
Danville, Va.
Vouchers: W. E. Cotton and I. S. McAdory.
WALDECK, GEORGE R., D.V.M.
1800 S.W. 11th St., Miami 35, Fla.
Vouchers: W. E. Cotton and I. S. McAdory.
WILLIAMS, JAMES E., D.V.M.
179 Poplar St., Jackson, Tenn.
Vouchers: I. S. McAdory and W. E. Cotton.

Colorado A. & M. College

RUCKER, ELLWYN E., D.V.M.
Henderson, Colo.
Vouchers: K. W. Smith and J. Farquharson.
WAYT, LEWIS K., D.V.M.
140 E. Park Ave. (P. O. Box 1048), Durango, Colo.
Vouchers: J. Farquharson and K. W. Smith.

Michigan State College

SMITH, ORA L. II, D.V.M.
260 River Lane, Dearborn, Mich.
Vouchers: C. F. Clark and E. S. Feenstra.

Ohio State University

All of the following were vouched for by Drs. P. A. Soldner and W. F. Guard.
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Box 106, East Palestine, Ohio.
BARTH, HOWARD J., D.V.M.
Wellington, Ohio.
BOYD, JAMES B., D.V.M.
296 Beech St., Geneva, Ohio.
BRUCKNER, EDWIN, D.V.M.
645 Tiffin Ave., Sandusky, Ohio.
CARVER, JAMES E., D.V.M.
Michigan City, Ind.
CRAGO, WILBUR H., D.V.M.
Kinsman, Ohio.
CROSS, ROBERT F., D.V.M.
194 W. Home St., Westerville, Ohio.
CRYAN, JOHN H., D.V.M.
Rt. No. 2, Westerville, Ohio.
CUSTER, MILLWOOD A. JR., D.V.M.
1927 Indianola Ave., Columbus, Ohio.
DAVIDSON, DONALD J., D.V.M.
1928 W. Market St., Akron, Ohio.
EMERSON, EDWARD S., D.V.M.
235 S. Pierce St., Lima, Ohio.
FIELD, CLYDE W., D.V.M.
Rt. No. 3, Hamilton, Ohio.
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GONSER, ROBERT C., D.V.M.
3123 N. Cleveland Ave., Canton, Ohio.
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GROSS, W. BURNHAM, D.V.M.
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KERN, DORIAN J., D.V.M.
Neffs, Ohio.
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Turners Station, Ky.
NUSSENDORFER, BURR W., D.V.M.
c/o Dr. J. R. Krohn, Cloquet, Minn.
PORTMAN, RUSSELL F., D.V.M.
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WHITE, THOMAS P., D.V.M.
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University of Pennsylvania

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Vouchers: E. T. Booth and D. G. Lee.
BERGER, ROBERT L., V.M.D.
Star Route, Hamburg, Pa.
Vouchers: N. W. Riser and J. H. Mark.
BERTOLET, ROY D., V.M.D.
Herschel & Kelvin Ave., Somerton, Philadelphia, Pa.
Vouchers: F. E. Lentz and D. G. Lee.
BORGER, ELWOOD H., V.M.D.
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Vouchers: T. DeMott and J. D. Beck.
BRENNAN, BERNARD F., V.M.D.
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Vouchers: E. R. Cushing and R. C. Snyder.
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LACKEY, DONALD W., V.M.D.
Lenoir, N. Car.
Vouchers: F. E. Lentz and N. W. Riser.
LANGER, PETER H., V.M.D.
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Vouchers: A. C. Goebel and D. G. Lee.
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Vouchers: E. T. Booth and D. G. Lee.
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Vouchers: D. G. Lee and C. J. McAnulty.
PHILLIPS, GORDON F., V.M.D.
B.A.I., Dept. of Agriculture, Charleston, W. Va.
Vouchers: H. M. Martin and D. G. Lee.
RAMOS, TEODORO, V.M.D.
Libertadores 363, San Isidro, Lima, Peru.
Vouchers: D. G. Lee and E. T. Booth.
STEVENS, GLEN W., V.M.D.
Angels, Pa.
Vouchers: F. E. Lentz and N. W. Riser.
TAMM, EDDIE L., V.M.D.
1342 Prospect Dr., Pomona, Calif.
Vouchers: W. J. Lentz and G. A. Dick.

Texas A. & M. College

LEJEUNE, JOHN E. JR., D.V.M.
Sta. A, Rt. 5, Box 417-A, New Orleans, La.
Vouchers: R. C. Dunn and A. A. Lenert.

Second Listing

Michigan State College

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Blair, Harry E., D.V.M., R.R. No. 1, Danville, Ind.
Blake, James W., D.V.M., 3328 E. Michigan Ave, Lansing, Mich.
Brown, Ross G. Jr., D.V.M., 610 College, Columbia, Mo.
Byrd, Sherman C., D.V.M., Francesville, Ind.
Costello, Raymond C. A., D.V.M., 912 Monmouth St., Gloucester City, N. J.
Cottongim, Okey W., D.V.M., Brownsburg, Ind.
Decker, Winston M., D.V.M., 701 Michigan Ave., R. No. 2, Port Huron, Mich.
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Harman, Jack P., D.V.M., c/o Charles McCoy, Sr., Waseca, Minn.
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McDougle, Harold C., D.V.M., Veterinary Dept., University of Missouri, Columbia, Mo.

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Rose, George M., D.V.M., c/o Tom Patton, Huntsville, Mo.
Rudesill, Robert L., D.V.M., c/o L. C. Rudesill, R.R. No. 2, Baldwin, Wis.
Stickrod, Bernice E., D.V.M., Windsor, Mo.
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Juliff, Walter F., D.V.M., Box 341, Colorado City, Texas.
Kelley, Jackson C., D.V.M., c/o Gilliam & Upshaw Pharmacy, Waxahachie, Texas.
Koerth, Charles J. Jr., D.V.M., Oklahoma City 5, Okla.
Moseley, William T. Jr., D.V.M., Box 1088, Kingsville, Texas.
Palmer, Jack S., D.V.M., 1517 Mier St., Laredo, Texas.
Prater, Felix D., D.V.M., Box 308, Monahana, Texas.
Raplee, Robert G., D.V.M., Palacios, Texas.
Rogers, Owen L., D.V.M., 3720 Stanford St., Dallas, Texas.

State College of Washington

Holmes, Monroe A. Jr., D.V.M., 905 N. Stafford St., Portland, Ore.

U. S. GOVERNMENT

Bureau of Dairy Industry Changes.—R. R. Graves, who has been head of the Division of Dairy Cattle Breeding, Feeding, and Management Investigation in the BDI, of which O. E. Reed is chief, has resigned to accept the position of collaborator in the Bureau.

M. H. Fohrman has been appointed head of the Division in place of Mr. Graves. Since 1921, Mr. Fohrman has had charge of the Bureau's experimental breeding herds at the Agricultural Research Center, Beltsville, Md. Under his direction, these herds have become an important source of good proved bulls.

Joseph B. Parker has been transferred to Mr. Fohrman's former position, after spending seventeen years as the Bureau's extension dairyman in the eastern states.

Molasses Set-Aside Requested

The Department of Agriculture has formally requested the Civilian Production Administration to set aside 140 million gallons of molasses in 1946 for livestock feeding, says R. M. Field, president, American Feed Manufacturers Association.

Because there are demands upon the CPA from other groups who use molasses, it is suggested that veterinarians write or wire their Congressmen and Senators asking them to get in touch with the Chemical Section of the CPA, which has charge of molasses, advising them that it is essential for the sake of the livestock feeders of this country that this molasses be delivered to the Department of Agriculture to be distributed for feeding purposes.

CANADIAN GOVERNMENT

Organization of Animal Disease Control and Research in Canada.—Our attention has been called to an omission in the 1945 AVMA Directory wherein the organization of the Health of Animals Division was given, but should have included the roster of the Division of Animal Pathology as part of the Canadian veterinary service. Since many association members in the United States are not familiar with the Dominion veterinary service setup, we are pleased to list below the organization as it now exists.

At one time, the Health of Animals *Branch* of the Dominion Department of Agriculture (corresponding to the Bureau of Animal Industry, USDA) was made up of three Divisions—Contagious Diseases, Meat and Canned Foods, and Pathological. In 1937, the two former divisions were amalgamated to form the Health of Animals *Division* and the Pathological Division was raised to equal status with the Health of Animals Division. To give the picture of veterinary organization in Canada, it is therefore necessary to give the personnel of both Divisions, which follows. The AVMA is indebted to Dr. M. Barker, Veterinary Director General, for the organization roster of the Health of Animals Division, and to Dr. Charles A. Mitchell, Dominion Animal Pathologist, for the organization of the Division of Animal Pathology and for calling our attention to the setup of the Canadian service as it now exists.

ORGANIZATION OF THE HEALTH OF ANIMALS DIVISION, DOMINION DEPARTMENT OF AGRICULTURE, OTTAWA, ONT.

(Senior Positions Only)

Veterinary Director General—M. Barker, V.S.
Chief Veterinary Inspector—R. H. Lay, B.V.Sc.
Associate Chief Veterinary Inspector—(Tuberculosis Eradication)—Orlan Hall, B.V.Sc.

Associate Chief Veterinary Inspector—(Meat Inspection)—(Vacant).
Assistant Chief Veterinary Inspector—G. A. Rose, B.V.Sc.

OFFICERS IN CHARGE IN PROVINCES

British Columbia—F. W. B. Smith, B.V.Sc., 350 Hastings St., W., Vancouver, B. C.
Alberta—Dr. V. V. Christie, 414 Public Bldg., Calgary, Alta.
Saskatchewan—Dr. N. D. Christie, 301 Post Office Bldg., Regina, Sask.
Manitoba—(Vacant), 813 Dominion Public Bldg., Winnipeg, Man.
Ontario—Wm. Moynihan, V.S., 366 Keele St., Toronto 9, Ont.
Quebec—J. O. Langevin, M.D.V., Room 524, 400 Youville Square, Montreal, Que.
Prince Edward Island, New Brunswick, and Nova Scotia—Dr. A. C. Lundie, Box 338, Moncton, N. B.

ORGANIZATION OF DIVISION OF ANIMAL PATHOLOGY, DOMINION DEPARTMENT OF AGRICULTURE, OTTAWA, ONT.

(Science Service)

Chief of Division and Assistant Director—Chas. A. Mitchell, B.V.Sc., D.V.M., F.R.S.C.
Assistant Chief—C. W. McIntosh, B.V.Sc.
Chief Research Officer—Ronald Gwatkin, B.V.Sc. D.V.Sc.
Head, Section of Bacteriology—J. L. Byrne, B.A., B.Sc., M.Sc.
Head, Section of Biochemistry—J. A. Nelson, B.Sc., M.Sc., Ph.D.
Head, Section of Biologics—C. W. McIntosh, B.V.Sc.
Head, Section of Histopathology—P. J. G. Plummer, B.V.Sc.
Head, Section of Parasitology—W. E. Swales, B.V.Sc., Ph.D.
Head, Section of Serology—(Vacant).
Head, Section of Virology—R. V. L. Walker, B.V.Sc. (On Military Leave).

OFFICERS IN CHARGE OF BRANCH LABORATORIES

Pacific Area—E. A. Bruce, V.S., Experiment Station, Saanichton, B. C.
Prairie Area—R. C. Duthie, B.V.Sc., D.V.Sc., Lethbridge, Alta.
Parasitology—W. E. Swales, B.V.Sc., Ph.D., Institute of Parasitology, Macdonald College, Ste. Anne de Bellevue, Que.
Poultry Pathology—A. B. Wickware, V.S., (Acting), Ottawa, Ont.

AMONG THE STATES

California

Joint Meeting.—The Southern California Veterinary Medical Association met jointly with the Small Animal Veterinary Medical Association on Feb. 22, 1946, at Los Angeles. The 42 members and guests heard Dr. Floyd Parks, formerly a colonel and chief surgeon on Iwo Jima, speak on medical advances which had been applied in the war.

Officers elected for 1946 by the Small Animal Association are: Dr. C. M. Baxter, Alhambra, *president;* Dr. Rollin Smith, Hollywood, *vice president;* and Dr. Ivan A. Peterson, Pasadena, *secretary-treasurer.*

S/IVAN A. PETERSON, *Secretary.*

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Personal.—Dr. Charles Eastman (K.C.V.C. '04) has retired from his position with the Los Angeles county health department, where he had spent seventeen years. He plans to remain active as a consultant in the dairy industry, working from his residence at 725 S. Vancouver Ave., East Los Angeles.

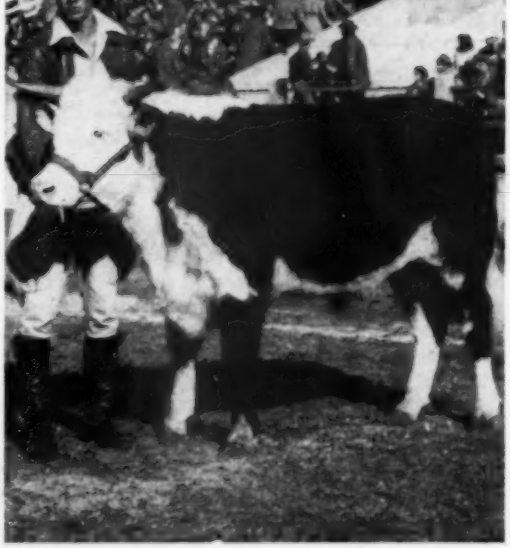
S/J. L. TYLER.

Connecticut

Wanted: More Veterinarians for Connecticut.—Under this banner headline, the *Hartford Courant Magazine* for Dec. 16, 1945, in a five-column story, including three pictures, pointed out the shortage of veterinarians and of veterinary colleges, and told of a movement to establish in New England an approved college of veterinary medicine. Dr. Edward Laitinen, of West Hartford, Dr. A. T. Gilyard, of Waterbury, and Dr. Richard T. Gilyard, also of Waterbury, were mentioned among the persons actively interested in this movement.

Florida

Showmanship Winner.—Alton Simmons, of Plant City, is the winner of the $25 U. S. Saving Bond awarded annually by the Florida



Alton Simmons, of Plant City, and the steer with which he won the annual showmanship contest at the Southeastern Fat Stock Show at Ocala.

State Veterinary Medical Association to the winner of the showmanship contest for FFA and 4H boys and girls, at the Southeastern Fat Stock Show in Ocala.

The young man is a major in agriculture, is in the eleventh grade, has carried out a fat steer project the past two years, and has won more than $100.00 in prizes with his steer this year.

More than 50 entrants contested for this prize, and Alton Simmons is the first boy to win this award during the five years that it has been offered by the association.

s/V. L. BRUNS, *Secretary.*

Georgia

Addresses Rotary Club.—Dr. Wm. L. Sippel, head of the department of animal diseases at Georgia Coastal Plains Experiment Station, Tifton, spoke to the Tifton Rotary Club on March 19, using as his subject "The Veterinary Profession."

Illinois

Mastitis Control Program.—The statewide demonstration program in bovine mastitis, established as a war emergency measure, has reached 47,210 cows owned by 674 dairymen in 38 counties. It has been conducted by seven veterinarians who were called for war food assistants. The operation of the program was discussed in the JOURNAL (January, 1946, p. 58). In more than 60 communities, the private practitioners have worked with the war food assistants.

The project, which ceases to be a demonstration program on June 30, will be handled thereafter by the herd owners and veterinary practitioners. Only a small fraction of the owners of dairy herds are taking adequate precautions against mastitis, which, in Illinois, is believed to cause an annual loss of 276 million pounds of milk—the amount produced by 55,000 average cows. Under the plan which will continue after June 30, the laboratory facilities will still be available to veterinarians and cattle owners.

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Personal.—J. M. Severns, Ph. D., formerly assistant in animal genetics at the University of Illinois, is now bacteriologist and director of research and development of the American Scientific Laboratories, Polo.

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Chicago Veterinary Officers.—Veterinary Corps officers stationed in the Chicago area met at the Meat and Dairy Hygiene School of the quartermaster depot on March 19, 1946. Dr. R. C. Klussendorf, assistant secretary of the AVMA, Chicago, discussed "Brucellosis, and its Control."

It is expected that meetings will again be held monthly, although there was a lapse of several months during the period of rapid demobilization and while there was a rapid turnover in personnel. Major Donald Kelley, V. C. (K.S.C. '35), is in charge at the school, assisted by Captain M. C. Lockwood, V. C. (M.S.C. '41). In addition to a class for veterinary officers the school now also conducts a class for enlisted personnel assigned to the Veterinary Corps.

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Dr. C. E. Fidler Promoted.—Gov. Dwight H. Green announced the appointment of Dr. C. E. Fidler to the position of superintendent of the Illinois Division of Livestock Industry to succeed Mr. Geo. A. Fox, who resigned on March 30, 1945. This is a definite improvement in the organization of the Division, because a veterinarian should head a division which engages in such a wide variety of disease-prevention and disease-control programs and activities. Dr. Fidler has a clear vision of the needs of the state with reference to livestock disease and its control, and it is felt that real progress will be made under his leadership.

s/ A. K. KUTTLER,
Inspector In Charge.

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Dogs Poisoned.—When 26 dogs were found dead in twenty-four hours in McLean County, two bodies were sent to the veterinary pathology laboratory at Urbana, where it was found that they had been killed by strychnine. The veterinarians at the laboratory urged that police protection be sought in lieu of indiscriminate poisoning when stray dogs become a nuisance.

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Meeting at Rockford.—The Northern Illinois Veterinary Medical Association met on March 27 in Rockford. In addition to reports from the officers and committee chairmen, the following program was presented:

Dr. C. F. Cairy, Michigan State College, East Lansing: "Physiology of Reproduction."

Dr. H. J. Hardenbrook, University of Illinois, Urbana: "The Cowpox Syndrome." This was discussed by Dr. G. W. Jensen, practitioner, Antioch.

Dr. R. M. Carter, practitioner, Alexis, acted as chairman of a panel which discussed "Swine Management." He was assisted by three practitioners, Drs. J. B. Baber of Stockton, A. J. Legner of Leland, and H. R. Hornbaker of Galesburg.

Dr. J. O. Alberts, University of Illinois, Urbana, substituted for Dean Robert Graham in bringing the latest information concerning the progress being made by the Illinois College of Veterinary Medicine.

At the banquet, Dr. Cairy demonstrated his versatility by performing acts of prestidigitation, legerdemain, and extraordinary memory feats.

s/ P. T. GAMBREL, *Secretary.*

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Veterinarian Top Swine Breeder.—Dr. W. W. Warnock (Ont. '04), Aledo practitioner, is named by *Hog Breeder* as one of the country's successful breeders of purebred hogs. Of an important sale, the reporter writes: "Doc

Warnock had the best pig he had ever raised . . . a linebred Steam Roller boar." Dr. Warnock is a former member of the state board of veterinary examiners, a practitioner of the upper bracket, and a gentleman farmer who farms.

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Chicago Association.—Dr. Robert Green, University of Minnesota, St. Paul, was the guest speaker at the meeting held on April 9. He discussed "Viruses, and Virus Diseases," and answered questions presented by the members in attendance.

s/R. C. GLOVER, *Secretary.*

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Hogs Bring Record Price.—Top Spot, prepotent sire of Duroc gilts, was bought for $4,000 by W. W. Stock Farm, of Pittsfield, at an Iowa sale in January, where 42 offerings averaged $214. Top Spot, whose sire was a $3,000 boar, was bred by S. I. Kincaid & Son, of Fairfield, and was sold as a pig to Harper & Sons of Storm City, Iowa.

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Ken-L-Products Award.—The award of Chappell Bros., Ken-L-Products Division of Quaker Oats, for the best service in the dog field for the Middlewest went to Lt. Commander Wm. C. Necker of Wheeling. The award for the Pacific Coast was presented to Ruth Martin of Camarillo, Calif., and that for the South to Mrs. K. E. Steinmetz of Knoxville, Tenn., well-known bench show judge and breeder.

Indiana

Michiana Association.—The annual Spring Clinic will be held at Nappanee on May 22, and will feature practical demonstrations on cattle, sheep, swine, poultry, and dogs. Ladies are invited, and banquet reservations should be made with Dr. W. A. McKenzie, Nappanee.

Iowa

Practitioners' Clinic.—The Eastern Iowa Veterinary Association will hold its Twelfth All-day Practitioners' Clinic on May 28 at the Dairy Cattle Congress Grounds, in Waterloo. Dr. C. B. Strain, of Dunkerton, is chairman of the General Clinic Committee, and he will be assisted by the following committee chairmen:

Dr. M. C. Larson, Keystone, committee on restraint.

Dr. Isaac E. Hayes, Cedar Falls, equine section.

Dr. John W. Carey, West Liberty, bovine section.

Dr. Guy C. Brown, Hudson, porcine section.

Dr. C. R. Fry, Centerville, ovine section.

Dr. Jos. W. Sexton, Sumner, avian section.

Dr. L. L. Boxwell, Cedar Falls, pet animal section.

Dr. C. B. Strain, general arrangements committee.

Dr. R. E. Elson, Vinton, registration committee.

Dr. John B. Bryant, Mount Vernon, handy devices and appliances.

Dr. J. H. Spence, Clinton, instrument checking.

Dr. J. W. Lucas, Abingdon, Ill., loud speaker announcements.

Mrs. C. B. Strain, Dunkerton, ladies luncheon.

Dr. W. L. Stroup, Corinth, Miss., will demonstrate restraint in farm animals.

Dr. Geo. R. Fowler, Iowa State College, Ames, will act as head surgeon.

Dr. L. A. Merillat, AVMA, Chicago, Ill., will captain the diagnostic consultants.

All who expect to attend should so inform Chairman Strain as soon as possible in order that proper arrangements for the luncheon may be made.

s/C. C. GRAHAM, *Secretary.*

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Encephalomyelitis in 1945.—A total of 148 cases of equine encephalomyelitis were reported in Iowa during 1945, of which 3 were animals that had been vaccinated more than ten days previously. There were 46 deaths reported from the same cause, of which 3 were animals vaccinated more than ten days previous to appearance of disease. This is a decrease of 1,973 cases and 414 deaths as compared with those reported in 1944.

There is no evidence that the eastern type of virus was present, although this should be suspected where vaccination with the western type vaccine failed to confer immunity, says the report from Dr. C. C. Franks and J. A. Barger, both of Des Moines.

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East Central Association Meets.—Tipton was the scene, and March 14 the date, of a meeting of the East Central Iowa Veterinary Medical Society. Attendance consisted of 44 veterinarians from 12 counties.

Dr. George R. Fowler, Iowa State College, Ames, presented an instructive discourse on "Anesthetics Used in Animal Surgery." Discussion of the paper was led by Dr. Frank M. Wilson, of Mechanicsville.

Dr. J. D. Ray, Corn States Serum Co., Omaha, Neb., gave a comprehensive paper on "The Causes of Baby Pig Losses"; he also discussed "Brucellosis of Swine." Dr. Warren E. Bowstead, of Lowden, led the discussion, and also related some of his army experiences in the treatment of anemia in pigs in the Hawaiian Islands.

Dr. Jas. C. Carey, practitioner, of West Liberty, recounted his impressions of a three-day conference at Alabama Polytechnic Institute at Auburn.

Dr. N. R. Waggoner, practitioner, of Olin, told of an interesting case report, i.e., the treatment of a wound caused when a horse reared up and came down on a fence post. The wound was closed under general anesthesia.

s/JOE W. GIFFEE, *Secretary.*

Kansas

District IV Meets at Wichita.—On the evening of February 9, the veterinarians of District IV and neighboring districts met at the Allis Hotel, Wichita, to hear Mr. Will J. Miller, livestock sanitary commissioner, and Dr. W. E. Logan, inspector in charge, both of Topeka, explain in detail the new brucellosis regulation and the three plans for control and eradication of the disease.

s/ C. W. BOWER, *Secretary.*

Kentucky

Joint Meeting Moves.—The joint meeting of the Kentucky Veterinary Medical Association and the Southern Veterinary Medical Association, which was originally scheduled for Lexington, will be held instead at Louisville, Ky., with headquarters at the Brown Hotel. The dates are Sept. 30 and Oct. 1 and 2. All veterinarians who expect to attend are urged to send their reservations at once to the Brown Hotel.

s/F. M. KEARNS, *Secretary.*

Missouri

Poultry Industries Conference.—The annual Fact Finding Conference of the Institute of the American Poultry Industries, with Dr. Cliff D. Carpenter, of Chicago, presiding, may be signalized as one of the outstanding postwar meetings devoted to the nation's food supply. The conference was dedicated to holding the phenomenal gains of 1 billion to 3 billion dollars in recent years by putting poultry squarely in competition with other food through quality as the basis.

"With the wartime honeymoon over," said President Carpenter, "only by quick return to quality can the poultry industry hope to retain a fair share of the consumer's food dollar."

Hobart Creighton, head of the Poultry Branch of the USDA, in giving the government's view of the poultry picture, emphasized both quality and price at a fair profit consistent therewith as the motivating factors.

Famed poultry specialists and veterinarians, hatcherymen, public health officials, and processors participated in the program, among whom were Dr. D. C. Warren, Kansas State College; Dr. R. George Jaap, Oklahoma A. & M. College; Dr. W. A. Maw, MacDonald College, Quebec; Prof. H. H. Alp, University of Illinois; E. M. Funk, University of Missouri; A. E. Abrahamson, New York City Health Department; and M. F. Gunderson, University of Nebraska. The number of veterinarians occupying high places in this movement to bring economic stability to the poultry industry can be construed as a compliment for the contributions of veterinary science toward its success. Various technical problems related directly to the progress of poultry and egg production were presented: blood spots, pasteurization of egg powder, preservation of freshness, breeding practices, and others.

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Kansas City Association.—The March session was characterized by an impromptu survey of "Feed Conservation," Phil Evans, KMBC Farm Hour commentator assisting, and a group discussion of "Obstetric Problems and Their Solution," by Dr. D. C. Wendt, Banner Springs, Kans., chairman. Dr. R. B. Roger, of Joplin, and Dr. E. J. Montgomery, of Harrisonville, answered questions on small animal obstetrics and large animal obstetrics, respectively.

s/GAIL B. SMITH, *Secretary-Treasurer.*

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St. Louis District Meeting.—The April meeting was held at the Roosevelt Hotel on the regular date, first Friday of the month, at 8:00 p. m. Dr. R. C. Klussendorf, of the AVMA, discussed the need for, and the manner of, procuring the Research Fund which will be spent under the supervision of the Research Council of the AVMA. He later led a discussion among the members on the diagnosis, treatment, and control of mastitis in dairy cattle.

s/C. W. DARBY, *Secretary.*

Nebraska

Meeting at Norfolk.—The Northeastern Nebraska Veterinary Medical Association, meeting on March 12, 1946, at Norfolk, with 64 members assembled, participated in a lively discussion of current problems which was conducted by President H. L. Bennett as moderator.

Officers elected for 1946 are: Dr. Kenneth Bruce, of Orchard, *president;* Dr. L. W. Price, of Wisner, *vice president;* Dr. F. O. Lundberg, of Wausa, *secretary-treasurer.*

s/ PAUL L. MATTHEWS, *Resident Secretary*

New Jersey

Sixty-Second Annual Meeting.—The Veterinary Medical Association of New Jersey held its annual meeting at Trenton, Feb. 7-8, 1946. The session was opened with the address of President J. A. S. Millar, of Deal, followed by reports from the several committees. The scientific program was composed of the following papers:

Dr. Lester R. Barto, Basking Ridge: "Distemper Control, Abdominal Sutures, and Other Case Reports."

Dr. John D. Gadd, Towson, Md.: "The Future for Surgery of the Horse."

Dr. Louis A. Corwin, Jamaica, N. Y.: "Treatment of External Parasites of Small Animals."

Dr. James M. Murphy, Agricultural Experiment Station, Sussex: "Penicillin in Mastitis."

Dr. S. J. Roberts, Cornell University, Ithaca, N. Y.: "Some Observations on Various Phases of Dairy Cattle Practice."

Dr. F. R. Beaudette, Agricultural Experiment Station, New Brunswick: "A Discussion of Newcastle Disease."

Dr. W. F. Verwey, Sharp & Dohme, Glenolden, Pa.: "Brucella Abortus Vaccine Dessicated by Lyophilization."

Mr. Roy G. Howells, Philadelphia, Pa., the guest speaker at the dinner meeting, selected as his topic, "When Were You Born?"

The following motion pictures were shown during the meeting: "The Veterinarian and Public Relations," by the Associated Serum Producers; "Artificial Insemination," by University of Pennsylvania; "Studies in Fertility," by Ortho Pharmaceutical Co.

All of the officers were reëlected, and are as follows: Dr. J. A. S. Millar, of Deal, *president;* Dr. R. S. Huff, of Newton, *first vice president;* Dr. J. R. Porteus, of Trenton, *secretary;* Dr. J. B. Engle, of Summit, *treasurer.*

s/J. R. PORTEUS, *Secretary.*

New Jersey

Honors to Biochemist Waddell.—On the occasion of New Jersey Farmers' Week, in the presence of 200 poultrymen, the State Poultry Association awarded its Golden Egg for Distinguished Service to Dr. James Waddell, director of biological research for E. I. du Pont de Nemours Company, Inc., of New Brunswick, who discovered and supplied vitamin D-activated animal sterol (=Delsterol), which is credited with having helped the poultry industry to reach new heights of productivity. The discovery was made in 1931 and played an important part in the wartime food production which brought fame to the poultry industry as a dependable source of human subsistence.

—Courtesy of Poultry Tribune

Left to right—Professor Walter C. Russell, Rutgers University; Dr. James Waddell, director, E. I. du Pont de Nemours Biological Research Laboratory; Hon. W. H. Allen, State Secretary of Agriculture.

New York

New York City Association.—L. G. Gemmell, Ph. D., entomologist for the American Cyanamid Co., was the speaker at a meeting held on April 3 at Hotel Pennsylvania. His subject was "The Newer Insecticides For Animal Pests."

Dr. Jacob Lebish described a case report, "Removal of a 10-inch Plastic Knitting Needle from the Esophagus of a Boston Terrier."

s/C. R. SCHROEDER, *Secretary.*

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Animal Hospital Association.—The American Animal Hospital Association held its Twelfth Annual Meeting at Hotel Pennsylvania, New York City, April 16 to 18, at which time a scientific program was presented as follows:

Dr. C. P. Zepp, New York: "Address of the President."

Dr. Donald Eastman, Miami, Fla.: "The Use of DDT in Controlling External Parasite of Dog and Hospital Premises."

Dr. Wayne Riser, Des Moines: "Urological Interpretation as Applied to Small Animal Practice."

Dr. Joseph DeVita, New Haven, Conn.; "Therapeutic Application of Endocrine Products in Small Animal Practice."

F. A. Mettler, M. D., College of Physicians and Surgeons, Columbia Univ., New York: "The Anatomiphysiologic Basis of Neurologic Disorders in Small Animals." (Illustrated with movies.)

Dr. Carl F. Schlotthauer, Mayo Research Foundation, Rochester, Minn: "Clinical Differential Diagnosis of Central Nervous Disorders in Dogs."

Dr. John Gadd, Towson, Md.: "Sterile Surgical Technique Demonstration."

Dr. C. N. Bramer, Evanston, Ill.: "Reconversion Planning, with Special Reference to Personnel."

Drs. J. V. Lacroix, Evanston, Ill.; E. B. Dibbell, Baltimore, Md.; and Otto Stader, Ardmore, Penna.: "Hospital Design and Construction."

Dr. James Farquharson, Colorado State College, Fort Collins, and president of the AVMA: "Surgery, Sutures, and Suture Material: Demonstrated by Movies."

Capt. Frank P. Kreuz, M.C., U.S.N.: "Orthopedic Surgery: What Constitutes Sound Fracture Treatment."

Dr. E. B. Dibbell, moderator, and Drs. C. F. Schlotthauer, C. P. Zepp, J. V. Lacroix, and J. B. Engle: "Panel Discussion on Distemper."

Dr. J. A. S. Millar, moderator, and Drs. C. E. DeCamp, M. L. Morris, and L. W. Goodman: "Panel Discussion on Penicillin Therapy."

Dr. J. V. Lacroix: "Public Relations: The Importance of a Small Animal Hospital to the Community."

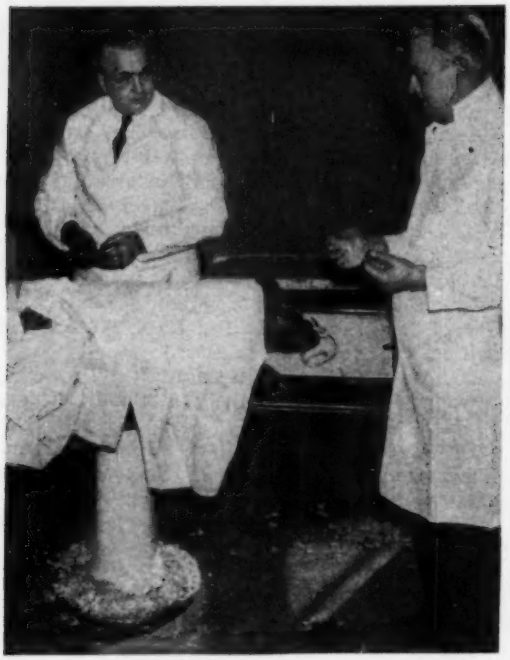
Dr. James Farquharson: "The Necessity of an Organized Research Program with Special Reference to Small Animals."

Dr. C. R. Schroeder, Lederle Laboratory, Pearl River, N. Y.: "Rabies Vaccine."

Dr. Alexander Zeissig, N. Y. State Department of Health, N. Y.: "Field Control Activities in Rabies."

s/R. E. RUGGLES, *Secretary.*

North Carolina



—From N. Car. Extension Farm-News

Dr. Otto Stader, Ardmore, Pa. (left), and Dr. M. M. Leonard, Asheville, N. C., demonstrate the use of the Stader splint at the annual conference of the North Carolina Veterinary Medical Association.

North Dakota

Cattlemen Honor Veterinarian.—Dr. Ralph E. Shigley, of Minot, was awarded a life membership in the Mouse River Cattlemen's Association, in recognition of his service to his community and his state. For 36 years, Dr. Shigley has served the cattlemen of this area; for 34 of these years he has been an assistant state veterinarian, and for 30 of them he has been a member of the State Veterinary Medical Examining Board. During the war years, he served as chairman of the Procurement and Assignment Service under the War Manpower Commission.

It is Dr. Shigley's distinction to be the oldest of three brothers who are veterinarians, the others being Dr. J. F. Shigley, professor of veterinary science at Pennsylvania State College, and Dr. Fred M. Shigley, recently appointed Inspector in Charge of the BAI of North Dakota.

s/T. O. BRANDENBURG, *Resident Secretary.*

Ohio

Veterinarian On The Air.—Dr. J. H. Lerfesty, Lyons, was guest speaker on the "Keep 'em Healthy" program over WLW on Saturday, April 13. He used the subject, "Freshening Troubles."

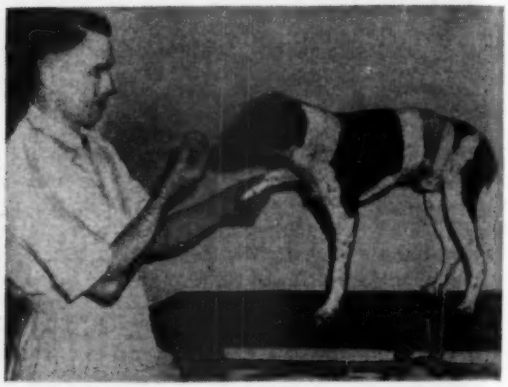
s/A. G. MADDEN, JR.

Ontario

Fast Milking and Sanitation Meetings.—Large and interested audiences attended a series of meetings held in prominent parts of the province in October (1945) under the coöperative direction of the De Laval company, local dairymen, and functionaries. More than 400 attended the Guelph meeting on October 12.

Oregon

Coin Collecting Dog.—Dr. William E. Ruggles, of Portland, (Colo., '27), is pictured in *The Oregonian* (Feb. 10, 1946) with Bobby, a 3-year-old Fox Terrier, and a silver half dollar which he removed from the intestinal tract of the dog. The coin had been missed some two months earlier, but at that time the dog was not suspected of being a coin collector.



—The Oregonian

Dr. Wm. E. Ruggles and Bobby.

Philippines

The Carabou.—The bulwark of Philippine agriculture is the working carabou which former Director of Agriculture Stanton Youngberg points out is endangered by the UNRRA plan to rehabilitate the islands with animals shipped from rinderpest-ridden countries. Rinderpest was completely eliminated from the Philippines through forty years of patient, scientific work and educational programs in the hands of Youngberg, Kelser, Boynton, Rodier, Reardon, and others, assisted by native veterinarians graduated by a veterinary school these men established in the course of the American occupation.

Puerto Rico

Dr. H. V. Cardona Honored.—The Sociedad Insular de Médicos Veterinarios honored Dr. H. V. Cardona at a dinner and special meeting on March 7, 1946. Dr. Cardona (C.V.C. '16) is a native of Puerto Rico, who has been in practice at Fort Worth, Texas, for twenty-six years during which time he has taken an active part in the activities of state and national veterinary associations.

The list of guests included Dr. Alfonso Rivera, president of the association; Dr. E. E. Maas, inspector in charge, Bureau of Animal Industry; Dr. F. Menéndez Guillot, chief, Division of Cattle Industry; Col. C. W. Betzold, V. C.; Capt. J. A. Echegaray, V. C.; Capt. C. J. Cardona, V. C.; Dr. Angel C. Pou, Ponce, prominent veterinarian of the southern coast; Dr. L. R. Barnes, Bureau of Animal Industry; Dr. O. A. López-Pacheco, Hato Rey; and others.

S/O. A. LÓPEZ-PACHECO, *Resident Secretary.*

Texas

Veterinary Alumni Organize.—The Veterinary Alumni Association of Texas A. & M. College was organized at Fort Worth on Jan. 14, 1946, "to assist in the development of the School of Veterinary Medicine at Texas A. & M., and to maintain acquaintance and fellowship among its graduates."

The following officers were elected: Dr. Geo. Burch ('38), Wichita Falls, *president;* Dr. Jack Whitehead ('35), Houston, *vice president.*

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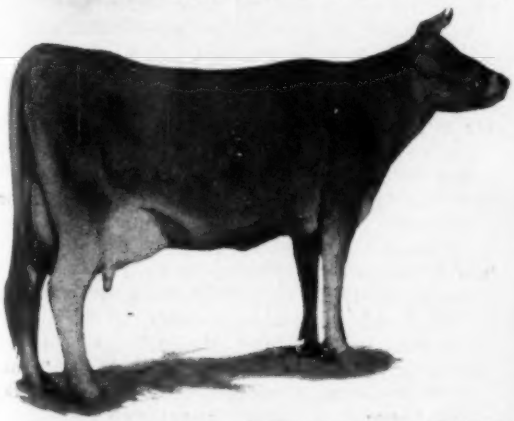
Panhandle Breaks a Record.—In the wind-blown Panhandle where the oldtimers wouldn't have taken a second look at the best dairy cow living a few years back, Welcome Volunteer



—*From The Jersey Bulletin*

Welcome Volunteer Tiff, 1316589, new Jersey champion senior 3-year-old.

Tiff, 1316589, tops the milk production 365-day record for senior 3-year-old Jerseys. She gave 19,416 lb. of milk containing 1,077 lb. of butterfat testing 5.55 per cent. Her performance was supervised and checked by three supervisors of Texas A. & M. College. The owner is Chester Elliff of Tulia.

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State Veterinarian.—Dr. Dan J. Anderson (Tex. '38), who succeeded Dr. E. A. Grist as state veterinarian in October (1945), served four years with the Veterinary Corps prior to his appointment. He was formerly a practitioner at Terrell, and is a native of Rockwell County.—*The Cattleman.*

Wisconsin

Mink Producers Employ Pathologists.—The Great Lakes Mink Association and the United Mink Producers' Association have coöperated to combat losses among mink. The joint committee which they set up *(National Fur News,* March, 1946) will employ two pathologists to work with the mink raisers and to coöperate with the Experimental Game and Fur Farm at Poynette. This farm, operated by the Wisconsin State Department of Agriculture, employs a veterinary pathologist and an assistant. The University of Wisconsin conducts experiments in genetics and assists in working out disease control measures. The University and the Game Farm do the research work, while the mink producers employ the men who do the field work to control outbreaks of disease and to set up disease-control programs. Salaries of the pathologists will be paid by the coöperating associations, but the individual rancher will pay for serum, travel expense, hotel rooms, and other incidental costs.

FOREIGN

Belgium

Carry Guinea Pigs Back Home.—Dr. Francis Van Dyck and Dr. Andre Bellot recently left the United States on a mission for the Belgian Economic Mission, carrying a crate of guinea pigs which had been inoculated with *Trypanosoma equiperdum.* This is the most reliable

—*U. S. D. A. Photo by Stenhouse*

Dr. Francis Van Dyck (left) and Dr. Andre Bellot with the specially constructed crate in which they are carrying inoculated guinea pigs back to Belgium.

method of carrying the culture, which is to be used in preparing antigen for conducting

the complement fixation test used in detecting dourine in horses.

Colombia

Veterinarians Visit United States.—Dr. Camp Gracia, assistant chief in animal husbandry of the livestock department, Ministry of Economy, of Bogota, headed a group of veterinarians who arrived at Miami, Fla., on March 18, 1946, to spend four months in making a study of the methods used in cattle raising in all parts of this country.

The other members of the party are Drs. Benjamin Gorzon of Bogota, Fermin Barona of Palmira, Carlos Noriega of Madellin, Julio Cervantes of Monteria, and Victor Plata of Sincelejo, all directors of veterinary experiment stations in their respective localities.

France

The Cattle of France.—The cattle of France are much larger than those of America. The cause is soil that is productive in nutritious vegetation and rich in bone-building minerals. In most regions, cattle are triple purpose stock—milk, meat, and work. There is no classification of cattle into beef and dairy types, as in the United States. The cattle of France have large bones and big, strong feet. There are many breeds—too many, Professor Dechambre used to say—but there is little if any cross breeding. The basis of the cattle-breeding program is the zoötechnics taught in the veterinary colleges. If there were to be developed but one type, that one would be a good beef type and a large milk producer combined in the same breed. The Normandy cattle conform to that idea.

Union of South Africa

Ban Against U.S.A. Dogs.—An application of the Witwaterstrand Kennel Club to permit the importation of dogs from the United States was rejected by the Pretoria authorities owing to the increase of rabies in this country. The American dog magazine, *Dog World*, protested on the ground that such restrictions interfere with international exchange of breeding stock.

COMING MEETINGS

Michiana Veterinary Medical Association. Spring Clinic, Nappanee, Ind., May 22, 1946.

Colorado Veterinary Medical Association. Veterinary Bldg., Colorado A. & M. College, Ft. Collins, Colo., May 23-24, 1946. A. W. Deem, Colorado A. & M. College, Ft. Collins, Colo., secretary-treasurer.

District of Columbia Veterinary Medical Association. Mayflower Hotel, Washington, D. C., May 21, 1946. W. M. Mohler, 5508 Nebraska Ave., N. W., Washington 15, D. C., secretary.

Eastern Iowa Veterinary Medical Association. Twelfth Practitioners' Clinic. Dairy Cattle Congress Grounds, Waterloo, Iowa, May 28, 1946. C. B. Strain, Dunkerton, general chairman.

Sociedad Insular de Médicos Veterinarios. Hato Rey, Puerto Rico, June 1-2, 1946. O. A. López-Pacheco, P. O. Box 155, Hato Rey, P. R., secretary.

Missouri Veterinary Medical Association. Colonial Hotel, Springfield Mo., June 10-11, 1946. J. L. Wells, Box 676, Kansas City 10, Mo.

Ohio State University, Annual Veterinary Conference. College of Veterinary Medicine, Ohio State University, Columbus, June 12-14, 1946. Walter R. Krill, College of Veterinary Medicine, dean.

Michigan State Veterinary Medical Association. Pantlind Hotel, Grand Rapids, Mich., June 25-26, 1946. B. J. Killham, Michigan State College, East Lansing, Mich., secretary.

North Carolina State Veterinary Medical Association. George Vanderbilt Hotel, Asheville, N. Car., June 27-29, 1946. B. H. Staton, Box 453, Rocky Mountain, N. Car.

Utah Veterinary Medical Association. Veterinary Bldg., Utah State Agricultural College, Logan, Utah, June 28-29, 1946. O. G. Larsen, 641 E. 7th St., North Logan, Utah, secretary.

Idaho Veterinary Medical Association. Boise, Idaho, July 1-2, 1946. Phil H. Graves, Box 186, Idaho Falls, Idaho, secretary.

New York State Veterinary Medical Association. Syracuse, N. Y., July 9-11, 1946. J. J. Regan, 1231 Gray Ave., Utica, N. Y., secretary.

North Dakota Veterinary Medical Association. Fargo, N. Dak., July 15-16, 1946. F. M. Bolin, 1503 S. 6th St., Fargo, N. Dak.

Montana Veterinary Medical Association. Helena, Mont., July 15-16, 1946. E. A. Tunnicliff, Montana Agricultural Experiment Station, Bozeman, Mont., secretary.

American Veterinary Medical Association. Eighty-third Annual Meeting. Hotel Statler, Boston, Mass., Aug. 19-22, 1946. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Southern Veterinary Medical Association and Kentuckv Veterinary Medical Association. Brown Hotel, Louisville, Ky., Sept. 30, and Oct. 1-2, 1946. F. M. Kearns, 3622 Frankfort Ave., Louisville 7, Kv., secretary-treasurer.

Pennsylvania State Veterinary Medical Association. Penn Harris Hotel, Harrisburg, Pa., Oct. 9-11, 1946. R. C. Snyder, N. W. Cor. Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Eastern Iowa Veterinary Association, Inc. Hotel Montrose, Cedar Rapids, Iowa, Oct. 15-16, 1946. C. C. Graham, Wellsburg, Iowa, secretary.

American Public Health Association. Cleveland, Ohio, the week of November 11, 1946.

United States Livestock Sanitary Association. Hotel La Salle, Chicago, Ill., Dec. 4-6, 1946. R. A. Hendershott, 33 Oak Lane Ave., Trenton 8, N. J., secretary-treasurer.

Chicago Veterinary Medical Association. Palmer House, Chicago, Ill., the second Tuesday of each month. Robert C. Glover, 1021 Davis St., Evanston, Ill., secretary.

Massachusetts Veterinary Association. Hotel Vendome, Boston, Mass., the fourth Wednesday of each month. H. W. Jakeman, 176 Federal St., Boston 10, Mass., secretary-treasurer.

New York City Association. Hotel Pennsylvania, New York, N. Y., the first Wednesday of each month. C. R. Schroeder, Lederle Laboratories, Inc., Pearl River, N. Y., secretary.

STATE BOARD EXAMINATIONS

Florida—The Florida Board of Veterinary Examiners will hold its next examination, June 17-19, 1946, at the George Washington Hotel, Jacksonville, Fla. Address inquiries to H. C. Nichols, secretary-treasurer, Box 405, Ocala, Fla.

Illinois—The Veterinary Examining Committee of the Illinois Department of Registration and Education will hold its examination, July 29-30, 1946, at 106 N. La Salle St., Chicago. Applications should be filed with Supt. Phillip M. Harman, Department of Registration and Education, Springfield, Ill. For other information also address Supt. Harman.

Iowa—The Iowa Veterinary Medical Examining Board will hold its next examination, June 17-18, 1946, 8:00 a.m., at the office of the Division of Animal Industry, State House, Des Moines, Iowa. Address inquiries to C. C. Franks, chief, Division of Animal Industry, State House, Des Moines 19, Iowa.

Louisiana—The Louisiana State Board of Veterinary Medical Examiners will hold its next examination, Aug. 14, 1946, at the State Capitol, Baton Rouge, La. Only applicants from accredited colleges are eligible. Address inquiries to J. Arthur Goodwin, secretary, New Iberia, La.

Nebraska—The Nebraska Bureau of Examining Boards will hold its next veterinary examination, June 20-21, 1946, 8:30 a.m., at the State Capitol Bldg., Lincoln, Neb. Applications must be filed with the Bureau at least 15 days prior to the first day of the examination. Address inquiries to Oscar F. Humble, director, Bureau of Examining Boards, Dept. of Health, Room 1009, State Capitol Bldg., Lincoln 9, Neb.

North Carolina—The North Carolina Veterinary Medical Examining Board will hold its next examination, June 27, 1946, at the George Vanderbilt Hotel, Asheville, N. Car. Address inquiries to P. C. McLain, secretary-treasurer, Route 1, High Point, N. Car.

BIRTHS

To Capt. (I.S.C., '43) and Mrs. Lawrence L. Espensen, 416 P. O. Bldg., Grand Rapids, Mich., a daughter, Vicki Mae, Jan. 9, 1946.

To Dr. (U.P., '45) and Mrs. George G. Meredith, Box 307, Bel Air, Md., a son, Donald Gibson, Feb. 8, 1946.

To Dr. (M.S.C., '42) and Mrs. Charles H. Coy, 97 N. Norwood, Hillsdale, Mich., a son, Charles H. II, March 2, 1946.

MARRIAGES

Dr. E. C. Bozeman (A.P.I., '45), Columbus, Miss., to Miss Martha Wood, Andalusia, Ala., Nov. 10, 1945.

Dr. Burton A. Ross (M.S.C., '42), 801 S. 13th St., Newark 8, N. J., to Miss Rosalyn Morgenstern, Detroit, Mich., Sept. 2, 1945.

Dr. Samuel Hodesson (O.S.U., '43), 249 E. Garvey Ave., El Monte, Calif., to Miss Marian Mason, Pasadena, Calif., Feb. 9, 1946.

Dr. William L. Sippel (U.P., '40), Dept. of Animal Diseases, Georgia Coastal Plain Experiment Station, Tifton, Ga., to Miss Catherine A. Morrison, Syracuse, N. Y., March 2, 1946.

Dr. J. J. Strandberg (C.V.C., '16), 1005 8th Ave., Belle Plaine, Iowa, to Gretchen V. Boyer, Belle Plaine, Iowa, March 9, 1946.

DEATHS

R. C. Banks (I.S.C. '43), 24, Tipton, Iowa, was killed in an automobile accident March 15, 1946, near Camp San Luis Obispo, Calif., where he was stationed. Dr. Banks, son of Dr. and Mrs. C. H. Banks, Tipton, served as a lieutenant in the Veterinary Corps, U. S. Army. He was admitted to the AVMA in 1943.

W. F. Egan (R.C.V.S '88), San Francisco, Calif., died Feb. 25, 1946, after a prolonged illness. Dr. Egan was admitted to the AVMA in 1895.

G. C. Emick (Ind. '04), 65, Berne, Ind., died March 10, 1946. Dr. Emick was born in Orrville, Ohio, on Feb. 18, 1881. He was admitted to the AVMA in 1936.

J. K. Mason (C.V.C. '04), 72, Campello, Mass., died April 8, 1946. Dr. Mason was a member of the Massachusetts Veterinary Association, and was admitted to the AVMA in 1921.

E. R. Page (Ind. '20), 50, Corydon, Ind., died Oct. 25, 1945. Dr. Page was born in Greene Co., Ind., on Jan. 21, 1896. He was admitted to the AVMA in 1941.

THE VETERINARY PROFESSION AND THE WAR

Awards and Citations

Legion of Merit Award.—First Lieutenant Thais A. deTienne, V. C., was awarded the Legion of Merit for exceptionally meritorious conduct in the performance of outstanding services. The citation says, in part, that she "demonstrated force tempered with tact and great professional skill as Supervising Veterinary Sanitary Inspector, Seventh Service Command, from January, 1944, to September, 1945. In this capacity, she played a prominent part in the program of research, development, and production of dehydrated foods, particularly dehydrated egg products."

—Signal Corps, U. S. Army

First Lieutenant Thais A. deTienne, V. C., being decorated by the Commanding General, Seventh Service Command, Major General Louis A. Craig, with the Legion of Merit, on January 17, 1946.

The JOURNAL (Nov. 1945, p. 329) carried the story of how Lt. deTienne became the first woman member of the Veterinary Corps of the U. S. Army.

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Colonel J. A. McCallam, V.C., director of the Veterinary Division, Office of The Surgeon General, was awarded the Bronze Star at the March meeting of the Medical Department.

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Colonel Russell McNellis, V.C., was presented with the Legion of Merit in recognition of the fact that "through his energy, courage, and veterinary skill, [he] successfully organized the Veterinary Service of Peru in the face of many obstacles. By continued effort and tact he aroused interest in elimination of animal tuberculosis. Through his professional skill as a veterinarian, and as a United States Army officer, he enhanced the prestige of the United States Army and definitely aided the acceptance of the United States Military Mission to Peru."

• • •

Lieutenant Colonel Robert J. Robertson, V.C., received the Legion of Merit citation which reads in part: "By his skillful administrative ability, untiring efforts, superior professional knowledge, he maintained the highest standards of hygiene and sanitation in food supplies of American troops and simultaneously conserved thousands of tons of vital supplies by his careful and highly supervised program of food inspection. His accomplishments reflect the highest credit for himself and the armed forces of the United States."

• • •

Major Terry S. Ozier, V.C., was awarded the Army Commendation Ribbon, and with it a citation which says: "During World War II the Medical Department carried out its mission with outstanding success. This achievement was made possible only through the combined efforts of all Medical Department personnel. Your service with the Medical Department has been exceptional when compared with others of the same grade of similar position, and I wish to commend you for your outstanding contribution. . . ."

Colonel George J. Rife, V. C., was awarded the Legion of Merit because, while acting as Port Veterinarian, San Francisco Port of Embarkation, he "developed a highly successful

—Signal Corps, U. S. Army

Major General Homer M. Groninger, Commanding General, San Francisco Port of Embarkation, presents the Legion of Merit to Colonel George J. Rife, V. C., on March 27, 1946.

ship and unit sanitary inspection service which contributed materially to the health, well being, and morale of troops moving to and from the Pacific Theater."

In a few weeks Colonel Rife will be retired, and will return to Kansas City, Missouri.

Veterinary Officers Separated from Military Service

Alabama
Cloyd, Grover D.
Franklin, Ira I.

California
Baker, Jack E.
Berner, W. T.
Camner, Murray H.
Cantwell, H. S.
Chastain, E. F.
Henry, Jerrold N.
McFarland, R. J.
Marold, Gordon J.
Moxley, Elmer D.
Parshall, C. J.
Stafford, Chas. D.

Colorado
Hamman, Fred I.

Connecticut
Larson, Raymond E.

Washington, D. C.
Hudson, Claude

Georgia
Sacks, Sander A.
Slappey, W. O.

Idaho
Wheelin, Thomas J.

Illinois
Angerer, Wm. J.
Elwood, G. S.
Hervey, William H.
Hinkle, T. C., Jr.
Miller, Walter W.

Iowa
Held, Harold E.
Koch, Emil L.
Moore, Leslie J.
Morton, Lynus R.
Nelson, C. L.
Smit, Chas. R.
Spaulding, D. L.
Watson, Clement E.

Indiana
Fox, Murl A.

Kansas
Monroe, Floyd E.
Rippetoe, C. W.

Kentucky
Nickell, Vernie L.

Louisiana
Starnes, Mervyn B.

Maryland
Wohnsiedler, H. G.

Michigan
Rea, Robert C.
Viergutz, Herb E.
White, Paul T.

Minnesota
Bek, Gerald C.
Cavanaugh, Jos. L.
Enge, Clifford O.
Hansen, F. W., Jr.

Missouri
Dicke, Walter E.
Stepp, Forrest A.

Nebraska
Norden, C. J., Jr.
Orton, Clifford T.

New Hampshire
Holmberg, G. W.

New Jersey
Todd, Wm., Jr.

New York
Berkowitz, Israel
Birch, Frank M.
Cairns, F. C.
Chazey, Edward P.
Faatz, Gerald A.
Gumaer, Kenneth I.
Jastremski, M. M.
Jewett, Robert F.
Milks, Richard V.
Steed, Donald J.
Steffen, R. J.
Tice, Albert K.
Udall, Robert H.
Van Wagenen, V. F.

North Dakota
Loften, Robert D.

Ohio
Collier, John R.
Jones, John L.
Pounden, Wm. D.

Oklahoma
Boston, L. D.
Wirtz, John H.

Oregon
Johnson, Norman E.
Sivyer, Roland E.

Pennsylvania
Davies, Frank J.
Eagelman, James G.
Flack, George R.
Ker, William Orr
Saturen, Israel M.

South Carolina
Parker, R. M.
Willis, Robert L.

South Dakota
Weaver, Gilbert S.

Tennessee
Seay, Lewis Edgar
Tellejohn, A. L.

Texas
Adams, James L.
Beckcom, E. A., Jr.
Gomez, Ralph G.
Heaton, J. W., Jr.
Pollard, Morris

Virginia
Branch, Lemuel A.
Perkins, F. E.

Wisconsin
Boyer, C. I., Jr.
Jones, Raymond A.

Washington
McDole, Donald H.
McMonagle, Wm. D.
Miller, Charles S.

Australian Veterinary Officer Honored

Major P. L. Bazeley, of Melbourne, was awarded the Order of the British Empire by King George VI for his excellent work in the development of penicillin production in Australia.

Major Bazeley was graduated from the University of Sydney, School of Veterinary Science, in 1938, and immediately became a research officer in the Council of Scientific and Industrial Research. He was later appointed to the staff of the Commonwealth Serum Laboratories, where he specialized on the study of *Streptococcus equi*.

Enlisting in the A. I. F. in 1941, he was posted to an armored division with the rank of captain, but, in 1943, while serving in New Guinea, he was ordered to proceed to the United States to investigate the production of penicillin on a commercial basis. As a result of the information made available to him, Major Bazeley was able to assemble equipment and begin production of penicillin upon his return to the Commonwealth Serum Laboratories at Melbourne. He was transferred to the medical services and promoted to the rank of major in 1944.

Because of the energy and organizing ability shown by Major Bazeley in making penicillin available to the medical services of the fighting forces in the Southwest Pacific area, and for the treatment of civilians in Australia, he has been awarded the Order of the British Empire.

Veterinary Officer Transferred

Colonel Joseph F. Crosby, V.C., has been transferred from the Veterinary Division of The Surgeon General's Office to the Presidio of San Francisco.

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Colonel George L. Caldwell, V. C., Hesperia, Mich., formerly Headquarters Third Service Command, Baltimore, Md., has been assigned to the Veterinary Division, Office of The Surgeon General.

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Major Terry S. Ozier, V. C., College Station, Texas, formerly Veterinary Division, Meat and Dairy Hygiene Branch, has been sent to separation center, Camp Fannin, Texas.

ASTP Program Terminates

The medical Army Specialized Training Program will be terminated by June of 1946, according to *News Notes*, Office of The Surgeon General, issued on March 15, 1946.

Dr. C. L. Davis Returns to Denver

The Bureau of Animal Industry announces that Dr. C. L. Davis has returned from military furlough to his position in the branch of the Pathological Laboratory in Denver. In order to take full advantage of the return of Dr. Davis (Colo. '21), who has been in the Army Medical Museum, Washington, D. C., meat inspection stations in the fourteen western states and in Hawaii will again send pathologic specimens to the Denver Laboratory.

Veterinarian Serves in Navy

Lt. (j.g.) Herbert J. Jenne (U.P. '40), after six months of training at Harvard University, was assigned to a naval amphibious force as a line officer. Sent to England in October, 1943, he became a part of assault force "O" for the invasion of Normandy, landing at Omaha Beach in the Vierville-Colleville area as a communications officer. It was his duty to spot enemy guns and relay coded firing instructions to the various craft of the group. The enemy guns were not fixed to fire out to sea, but were aimed up and down the coast and were excellently camouflaged. Because of failure of the coastal bombardment to materialize, and the fact that the 352nd Field Division of the German Army happened to be in that area on anti-invasion maneuvers and immediately joined in the defense of the coast, the landing was especially rough.

Upon completion of this assignment, Lt. Jenne was sent back to England for a rest and later reassigned to a shore base at Weymouth for a short period before reporting, as a replacement, to Motor Torpedo Boat Squadron 34 at Cherbourg, France. Here he served as third officer of the PT 507 which made nightly patrols in the area of the islands of Guernsey, Jersey, Alderney, Herm, and Sark, scanning the area with radar in search of enemy convoy or ship movements.

In March, 1945, Lt. Jenne received orders to join Motor Torpedo Boat Squadron 20, which was somewhere in the Pacific area. This was upon completion of a thirty-day leave in the states, so he flew from New York to San Francisco and beyond, touching Hawaii, Guadalcanal, New Guinea, and the Admiralty Islands in search of his squadron, which he finally joined in the Philippines. Immediately assigned to a boat as executive officer, he later became the commanding officer of PT 245. The end of the war found him still on Mindoro in the Philippines, training for the invasion of Japan.